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JUN 30 1906

NEW

SYSTEM OF VENTILATION,

WHICH HAS BEEN

THOROUGHLY TESTED

UNDER THE PATRONAGE OF

MANY DISTINGUISHED PERSONS,

BEING ADAPTED TO

PARLORS; DINING AND SLEEPING ROOMS; KITCHENS AND BASEMENTS; CELLARS, VAULTS AND WATER-CLOSETS; TENEMENT-HOUSES; SCHOOL, LECTURE, AND COURT-ROOMS; CHURCHES; LEGISLATIVE HALLS; POOR HOUSES, PRISONS, AND HOSPITALS; FACTORIES AND DYE HOUSES; BREWERIES AND DISTILLERIES; POWDER MAGAZINES; STORES AND SHOW WINDOWS; BANKING HOUSES; HOTELS AND RESTAURANTS; FRUIT AND PROVISION CLOSETS; PORK-PACKING HOUSES; STABLES; SHIPS AND STEAMBOATS; ETC., ETC., ETC.

SECOND EDITION.

BY HENRY A. GOUGE.

"If we breathe a gas that is noxious, or air that contains but a very small proportion of carbonic acid, we die."—*Anatomy, Physiology, and Hygiene*. BY PROF. JOHN C. DRAPER.

BROOKLYN :

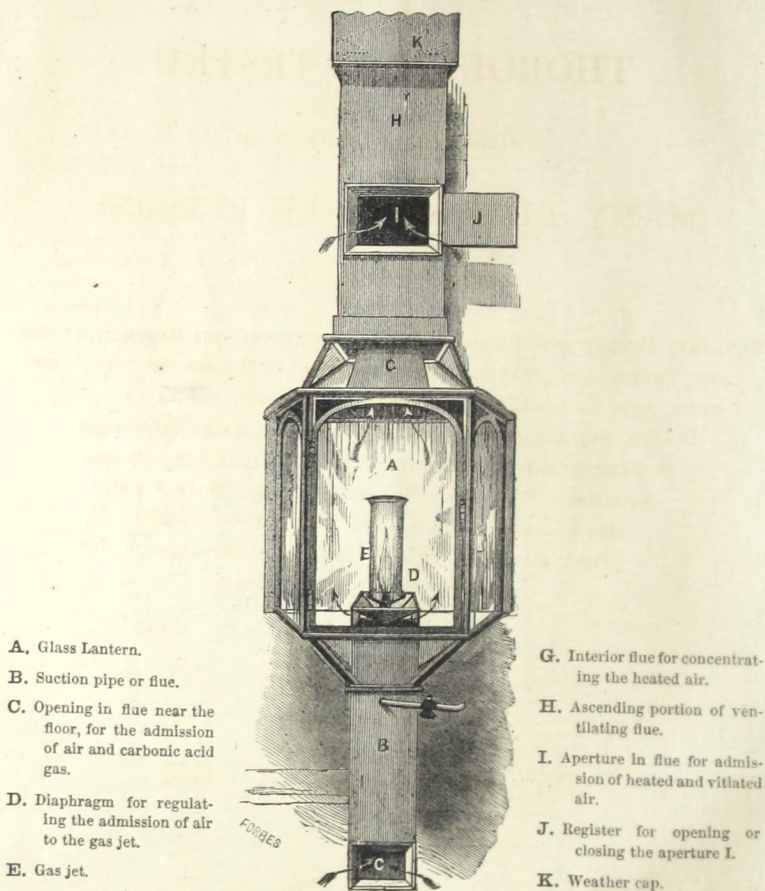
UNION STEAM PRESSES, 10 FRONT STREET.

1867.

Entered, according to Act of Congress, in the year 1867, by HENRY A. GOUGE, in the Clerk's Office of the District Court of the United States, for the Southern District of New-York.

GOUGE'S ATMOSPHERIC VENTILATOR.

PATENTED MAY 26, 1863; APRIL 25, 1865; AND MAY 9, 1865.



The arrows indicate the up-moving currents of air.

The combustion of the gas jet at E is supported by the air which enters at C; and along with this air, which acquires a powerful ascensional force through the heat of the lantern, the heavy carbonic acid gas also ascends and mingles with the heated air and lighter noxious gases which enter the ventilator at I, all passing upward and onward, by virtue of an irresistible motive power, until they are finally discharged into the atmosphere.

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NEW SYSTEM OF VENTILATION, &c.

THIS pamphlet is written for the purpose of giving a brief explanation of what is termed "*Gouge's Atmospheric Ventilator*," which was invented and patented some years ago. It has been extensively used since that time, having been put into practical operation in hundreds of instances, and in every instance with complete and entire success. In view of this positive assertion, which, it is believed, will be sustained by the gentlemen who have honored the writer with their names as references, it may as well be stated that the patentee never asks to be paid for his services until he has fully accomplished the object for which he has been employed. In this way he hopes to win the confidence of those who apply to him for his professional services. Although the principle involved in the new system of ventilation, which will be hereafter explained, is simple and obvious, yet the successful application of it is sometimes very difficult, owing to conditions and circumstances which he will not attempt in this place to describe; but with the varied experience which he has had for many years, ventilating, as he has done, some of the most difficult places that can be imagined, he believes that he will be able to render full and entire satisfaction to every one who may apply to him for his services.

FOUL AIR—WHAT MAY BE DONE BY VENTILATION.

Foul or noxious air, in any of its forms, is eminently dangerous to health and life, as every physician who has thoroughly studied the subject will admit; but if we have the *bane*, we also have the *antidote*. The Atmospheric Ventilator, when properly adapted to the purposes required, will banish foul air and unwholesome odors and gases from every part of one's domicile, workshop, store, office, building, or other unsavory or infected place, and furnish in their stead a full supply of fresh, pure, dry air, which will keep the blood in healthful circulation, and aid in counteracting the many tendencies to disease. The air of one's kitchen may be rendered as sweet as that upon the mountain-top, instead of being

permitted to permeate and contaminate the whole house, imparting a kitchen odor to one's parlors, bedrooms, and even the dresses in one's wardrobe.

Water-closets may be deprived of their effluvia, and thereby truly rendered what is termed a "*modern improvement*;" cellars and basements may be rendered dry and sweet, so that you may go into them without the risk of contracting an asthma or a rheumatism; and your sleeping rooms may have the carbonic acid gas which is discharged from the lungs in breathing, with other poisons exhaled from the surface of the body, carried off as rapidly as they are formed, instead of being taken back again into the lungs; and in the place of these noxious agents, you will have pure air, in a steady, gentle, continuous volume, introduced into your rooms without exposing the occupants to draughts, as is the case when the windows are opened; and thus, upon rising in the morning, you will feel refreshed and invigorated, fully prepared for the duties or toils of the day, instead of suffering with that languor and debility which are so frequently experienced after sleeping all night in a close and poorly ventilated room. Ladies will have a finer *rouge* upon their cheeks than they can get from pink saucers, if they will only accustom themselves to sleep all night in a fresh and pure atmosphere.

FOUL AIR AND DISEASE SYNONYMOUS—THE NEW-YORK TRIBUNE.

The writer of this is not a physician, but in the course of his professional duties, ventilating kitchens, basements, water-closets, offices, stables, and all sorts of places, he has seen enough to satisfy him that a great deal of disease results from bad air without the cause oftentimes being suspected. The people have yet to learn that pure air is one of the most essential requisites of a healthy existence. The influence of bad air has been constantly apparent to the writer. He recently visited a poor-house, in which there was no adequate ventilation, and the children were nearly all suffering with sore eyes and other marks of disease. They were wretched-looking objects. The directors feared the approach of cholera, and wished to have the place ventilated. When this is done, it will be found that much of the prevailing disease will disappear.

We ventilated a large banking-house in New-York City in which the air was extremely foul, and, when the work was done, the clerks experienced an immediate change in the atmosphere;

they felt refreshed and invigorated, instead of experiencing that sense of weariness and lassitude which accompanies a noxious air. One of the clerks, who had been for a long time asthmatic, immediately recovered his health.

A gentleman occupying a very handsome residence, had what he considered a damp and unwholesome parlor, for he scarcely ever came home from his counting-room and threw himself upon the sofa without feeling as though he had taken a severe cold. Underneath the parlor was a damp sub-cellar, to which I attributed the difficulty, and, upon establishing a proper ventilation, he ceased to take cold, and ceased also to be troubled with frequent attacks of rheumatic pains.

Let me add the authority of the *Tribune* in relation to the pernicious influence of bad air. My first introduction into the *Tribune* office was in consequence of a water-closet which had given them a great deal of trouble, imparting a disgusting odor to the editorial rooms. It had been pulled down and newly erected three times, but still the nuisance was not abated. The proprietors of the establishment wished to avail themselves of my mode of ventilation, which was duly established, and which gave so much satisfaction that I was complimented with an editorial notice in the *Tribune*, from which I make the subjoined extract: "More deaths occur annually in New-York which may be directly traced to bad ventilation, than are produced by all epidemical diseases combined. The atmosphere of many of the offices and counting-rooms is so poisonous that any one entering them from the fresh air is actually stifled, though unnoticed by the inmates, except by general lassitude, headaches, and incapacity for work. In our office we have introduced Mr. Gouge's system of ventilation with marked success. There may be as good, or even a better plan, but we have found this as effectual as any thing can be in ill-contrived rooms. But what we desire to see is some plan adopted whereby the exhausted and impure air which is generated in the crowded shops, offices, schools, and factories of our city may be constantly displaced by the introduction of fresh and vital air."

Not only man but the domestic animals suffer from impure air. We have frequently noticed this in ventilating horse stables. The poor animals, not having a full supply of pure air, gradually sicken, and begin to lose their sight. There is an immense amount of blindness among horses on this account. It does not seem to be understood that a horse needs fresh air quite as much as he needs hay or oats. We have seen splendid horses, which have cost the

owners several thousand dollars apiece, sold at auction for a mere song on account of blindness, induced by being shut up in close stables. This subject will be referred to again under the head of "Stables."

THE FOOD WE EAT—VENTILATED PROVISION CLOSETS.

This is a subject deserving more care and attention than it usually receives. We not only poison our blood with foul air, but frequently also by the use of improper food. The noxious gases which are so detrimental to the life forces, when taken into the lungs, will also, retained in refrigerators and provision closets, produce rapid putrefactive changes in the meat, fruits, and other articles of food which may be present. Food may be rendered unwholesome independently of a change which would be perceptible to the sense of smell. Carry off the noxious gases in question, however, as rapidly as they are formed, which is done in my *ventilated provision closets*, and it will be found that our most perishable fruits, of which strawberries are a very good type, will be preserved in a good condition for ten days or longer, and fresh meat will keep sweet and good in the hot weather of summer for several weeks, retaining in the mean time its natural red color. Nothing will explain better than this, to the popular mind, the baneful effects of noxious airs and gases, not only in hastening destructive changes in our food, but in deteriorating or destroying our health. Hence it is that a cheap and efficient system of ventilation is one of the great needs of the age—one of the most urgent wants of our social system.

NOXIOUS GASES—HOW THEY ACT UPON AND DESTROY THE BLOOD— DR. MATTSON'S TESTIMONY.

There are many noxious gases which find their way much too frequently into our breathing atmosphere, as *carbonic acid gas* from the lungs; *carbonic oxide* from imperfect combustion; and *carburetted* and *sulphuretted hydrogens* from the decomposition of animal and vegetable matter. The latter gas, so offensive to the smell, is an emanation also from water-closets and drains. In further explanation of this subject, I will quote from lectures entitled "Facts for the People concerning Health," etc., by Dr. Morris Mattson, formerly of Boston, but now of New-York City, in which good authority is given for the statement, familiar no doubt to every well-read physician, that sulphuretted hydrogen, an

some other gases, will not only darken the blood, but actually decompose it, so that it can not be restored by the oxygen of the air. We can not conceive of any more cogent argument than this in favor of properly ventilating our houses, offices, workshops, factories, and all buildings in which human beings are crowded together. We can not do better than to quote a few paragraphs from Dr. Mattson on this important subject. He says :

"Carburetted and sulphuretted hydrogens, along with carbonic oxide, are much to be dreaded when we take into account their peculiar action upon the blood. They produce their effects slowly, but with unerring results, unless the cause be removed. They darken the blood, as does carbonic acid ; but, unlike carbonic acid, they so change its character that it can not be restored to a healthful condition by oxygen. This is an important consideration. Liebig says sulphuretted hydrogen turns the globules of the blood blackish-green, and finally black ; and the original red color can not be restored by contact with oxygen, because a decomposition of them has obviously taken place. The globules darkened by carbonic acid, he adds, become again florid in oxygen, and also in nitrous oxide, which shows that they have undergone no decomposition. Here, then, is a difference between the two gases worthy of notice. Lehmann, the great German physiologist, who has the sanction of Professor Samuel Jackson, of the Pennsylvania University, (vide 'Manual of Chemical Physiology,') tells us that 'carbonic oxide and several carbohydrogens' color the blood almost black, and destroy the blood-globules, or, in other words, that they 'combine so firmly with the components of the blood-globules that the previous nature of the blood can in no way be restored.'

"It will be seen, therefore, that the poisonous gases to which we are frequently exposed and obliged to inhale, excepting the carbonic acid, tend directly to decompose or destroy the blood, so that it can never be restored. This is a sufficient explanation of the virulent effects of the gases in question. 'In the blood is the life,' says the inspired volume ; and whatever tends to disturb the healthful condition of that fluid must tend directly, and in an equal degree, to disturb the whole system. It need not seem extraordinary, then, that the gases aforesaid, acting suddenly and powerfully upon the system, should, as eminent medical authors allege, produce diarrhea, dysentery, cholera, typhus, ship and jail fevers, and even the pestilence. But we have these gases frequently in a more diluted form, pervading our kitchens, our

parlors, and our sleeping-rooms, and yet, perhaps, not appreciable to the sense of smell. Here, indeed, we have a secret foe, equally unseen and unheeded, which may sap the very foundation of life without our even suspecting the cause. If we become the victims of bad drainage, etc., we constantly inhale those gases while confined within our houses, and they as constantly decompose or destroy our blood. This is especially true at night, while asleep, with perhaps every window carefully and tightly closed, so as to prevent the slightest possible access of pure, fresh air. We find ourselves a little pale at first upon rising in the morning, with an unpleasant lassitude, and perhaps some nausea or headache; but we go into the fresh air, and these symptoms are dissipated. In truth, we do not regard them as very important. We renew the inhalations of the poisonous gases, day after day and night after night, until the blood is essentially changed in its healthy composition, and with it the whole system begins to suffer in a marked degree, taking the form of dyspepsia, neuralgia, rheumatism, bilious trouble, heart difficulty, or some other phase of chronic disease. The countenance being pale and haggard, the doctor prescribes some form of iron, with the hope of improving the blood, but for some reason or other he finds he can not produce a favorable change in that fluid. It does not seem to be understood that the blood is partially decomposed, and that the globules which have suffered this destruction can never be restored by any human agency; nor is *ventilation* thought of as a remedy which, if efficient, would speedily banish every vestige of the noxious gases which have caused all the difficulty, and which would prevent any further destruction of the blood-globules—the first thing, indeed, to be thought of as a curative means. Thus we are slowly and unconsciously poisoned—poisoned perhaps even unto death. We become the victims of a subtle agency of which our senses do not take cognizance; we yield to a cause of disease which is equally unseen and unheeded, but which is sure and terrible in its consequences.”

TO ARCHITECTS AND BUILDERS.

We respectfully solicit the judgment of architects and builders in relation to our method of ventilation. They are already fully informed as to the importance of the subject, and the community very naturally look to them for suggestions as to the best modes of guarding against disease, and especially such diseases as the cholera. No scientific architect need be told that, to preserve

health, *it is imperative to have perfect ventilation.* But very few architects or builders have been able to devise any efficient plan for accomplishing this result. To effect the object, all impure or vitiated air must be quickly removed, and fresh air continuously introduced in its place. We claim, upon the score of an enlarged experience, as well as upon the basis of scientific and philosophic truth, that our *Atmospheric Ventilator* will accomplish this in the most perfect manner, and as no other method of ventilation ever yet discovered is capable of doing. It is simple in its construction; it is extremely economical; it costs nothing to keep it in order; it requires no skill in its use and no attendance except the lighting of the gas jet; and it can be readily introduced into any apartment or inclosure requiring the interchange of a pure, fresh air for one that is impure and unwholesome. Let architects and builders, therefore, carefully study this matter in reference to the welfare of the public, and decide, according to their best judgments, upon the merits of the invention in question. It should be borne in mind, also, that when buildings are in process of erection, the ventilating fixtures can be put in to better advantage and at much less expense than after the building has been completed.

PARAN STEVENS, ESQ.—VENTILATION OF HIS STABLE, KITCHEN, AND REFRIGERATOR—MEAT-HOUSE IN THE FIFTH AVENUE HOTEL.

Mr. Stevens is a representative man, being the Napoleon of popular hotels in the United States. A. B. Darling, Esq., one of his partners in the *Fifth Avenue Hotel*, is also a representative man, though not so extensively known to the public as Mr. Stevens. He arranged the general plan and construction of the hotel, and is its chief manager, purchasing all the provisions and stores used in the establishment. In that capacity he applied to me for my services in ventilating his *meat-house*. When the hotel was first commenced, he used large provision closets or refrigerators, with the ordinary but wholly inadequate ventilation. These were soon abandoned, because it was found that the meats speedily spoiled. He then packed his meats in large chests, alternating with layers of ice, which preserved the meats a longer time; but it was found that the portions of the meat in contact with the ice would be bleached perfectly white, and had to be cut off and thrown away. This, of course, was a great loss. Nevertheless, this plan was continued for many years, until I constructed for him a large ventilated meat-house, capable of holding one or two

tons of meat, which he has used ever since. With a temperature not exceeding forty-five or fifty degrees, he can keep meat in the hottest days of summer as long as he desires, which is usually a week or ten days; and during this time it retains its red color, which indicates that it is in the best and most wholesome condition for food. I am assured that not a pound of meat has been lost since the meat-house was put into operation. It is with some little professional pride and pleasure, therefore, that I would suggest to a generous public, not already familiar with the culinary and other attractions of the Fifth Avenue Hotel, that if they are desirous of regaling their palates with the best and choicest meats which the market affords, they need only record their names as guests, at the above celebrated house. Indeed, it may be confidently stated that meats kept for a period of about ten days, (this is the theory of Mr. Darling,) in one of my ventilated meat-houses or provision closets, whereby they have no opportunity of absorbing the injurious gases constantly present in close or imperfectly ventilated refrigerators, have a savory richness and delicacy, and withal a nutritive quality, not characteristic of meats kept in the ordinary way.

Succeeding so well in the experiment with the meat-house, Mr. Darling employed me to ventilate all of his provision rooms, and also the large water-closet of the hotel, which had caused a great deal of trouble, and was a source of discomfort to the guests.

With this favorable introduction into the establishment, I was requested to call upon Mr. Stevens, whose name is at the head of this article, and who had been complaining for a considerable time of the inadequate ventilation of his horse stable, perceiving, when he entered it, a stifling atmosphere and an almost intolerable odor, which was perceptible in his horses even when they were brought into the open air; and withal, his horses appeared to be in an unhealthy condition, with cold ears, bloodshot eyes, and other signs of disease. It was under these circumstances that Mr. Stevens was desirous to avail himself of my new system of ventilation, for he had hitherto looked in vain for any relief from the troubles enumerated above. I found in his stable five very splendid horses, for one of which he had recently paid five thousand dollars. The stable I found to be almost destitute of ventilation, notwithstanding an ample flue put up at the head of each stall in the original construction of the building, and which the architect, without doubt, deemed all-sufficient for the purposes of ventilation. There was also, in addition to the flues, a large trap or ventilator in the

skylight; but, with all of these contrivances, the atmosphere in the stable was of the most offensive character, and the poor horses, valued at a little fortune, were suffering for the want of a due supply of that indispensable element of life and health, pure, fresh air. I proceeded at once to ventilate the stable, and in a few weeks after the work was completed, I called upon Mr. Stevens to inquire what had been the result of the experiment. He assured me that it had worked splendidly, and that his stable now abounded with a pure, sweet, and wholesome air. A great lover of that noble animal, the horse, as Mr. Stevens is known to be, I could not but observe the pleasure which he manifested in having been able to improve the sanitary condition of his favorite animals.

Deriving so much satisfaction from the introduction of a pure atmosphere into his stable, Mr. Stevens now had his attention recalled very forcibly to the sad condition of his kitchen, which, he said, abounded in offensive and unwholesome odors, and which, as is common in all similar cases, were constantly pervading the rooms above, and rendering his parlors, his art gallery, and other apartments extremely disagreeable. A ventilator, so called, had been placed in the flue, extending up from the kitchen, but it proved to be of no avail; and he had almost decided to tear down this flue and erect another in its place, extending to the height of five stories, with the hope that the defects herein described might be obviated. He was gratified to find, however, that instead of an expenditure of five or six thousand dollars, which a new flue would cost, he could have his kitchen ventilated by my simple method at comparatively little expense. The work was commenced and speedily completed, and I had the assurance of my patron that the experiment was entirely successful, and that he was no longer troubled with an impure or disagreeable atmosphere in his private apartments.

Mr. Stevens next desired me to ventilate a large refrigerator, which he used for his private purposes, and into which choice meats, game, and other provisions were placed for preservation. As he had become somewhat accustomed to the pleasures of a sweet atmosphere in his stable, kitchen, and private parlors, he had no difficulty in detecting the very impure atmosphere which pervaded this refrigerator. Indeed, upon opening the door, the air was almost sickening, and the idea of a dinner of sirloin or canvas-back was any thing but agreeable. And here it ought to be borne in mind that no food is fit to be eaten which is confined

a long time in such an atmosphere as here described. The provisions absorb the noxious gases which are present, and they are regarded by physicians as more or less poisonous to the blood and the whole system. Mr. Stevens was not to be censured for this sad condition of his private larder, for he knew not how to remedy the evil, and a peep into the refrigerators of our fashionable hotels, boarding-houses, and private dwellings will frequently disclose an odor not at all suggestive of "Sweet-brier" or "Verbena." Some months after ventilation had been established in the above refrigerator, I was informed that not a pound of meat, poultry, or game had been lost since the experiment was commenced, whereas previously to that time many of the articles put into it had been spoiled.

In due time I called upon Mr. Stevens to ascertain whether my labors in his behalf had proved satisfactory, and if so, whether he would favor me with a letter setting forth this fact to the public. Without any reserve, he replied: "Certainly, with great pleasure, because you are doing good to the public, and it is my duty to inform the public of the services which you are capable of rendering them. If I were not lame," added Mr. Stevens, "I would go about and advertise you myself."

VENTILATION IN NEW-YORK HOTELS—ALBEMARLE—BREVOORT HOUSE—FIFTH AVENUE HOTEL—ST. JAMES'S—ST. NICHOLAS—BRANDRETH HOUSE—MERCHANTS' HOTEL—WESTERN HOTEL—STEVENS HOUSE—INTERNATIONAL HOTEL.

The New-York hotels are probably unrivaled on the score of excellence and popularity. This is because they are usually managed by *wide-awake* men, who comprehend the public wants, and spare neither labor nor expense in adding to the attractions and substantial improvements of their establishments. Thus I am enabled to acknowledge, with equal pride and pleasure, the liberal patronage which has been bestowed upon me by the hotels in question. I have established ventilation, of one kind or another, in each of the hotels enumerated above, and in the order in which they are named.

The *Albemarle* was the first to show its appreciation of my new mode of ventilation, and there is now within the establishment one of my large *refrigerators* or *provision houses*, divided into apartments, each one of which is intended for the reception of some particular article of food, as fresh meat, cooked meats, fish, butter, pastry, etc.

The *Brevoort House* has been liberal in its patronage, having within the establishment a large meat-house, and a large refrigerator, divided into apartments, like the one mentioned above. One of these is used for the reception of *cut meats*, so that they may be ready at a moment's notice, when ordered by a guest; another for *cold meats*; a third for *jellies, pastries, ice-creams*, etc.; and the others for fish, butter, etc., as already named.

The *Fifth Avenue Hotel* has been specially mentioned in the last section, in connection with Mr. Stevens.

In all of the other hotels there are large ventilated meat-houses, so that the traveling public need not be in ignorance of the hotels at which they may obtain superior roast beef or savory steaks and chops. For my own part, I would prefer a third-rate hotel, with one of my ventilated meat-houses, to a first-class establishment, if it may be so termed, without any such improvement.

In the *Belmont* the *dining-room* is ventilated, which was the first dining-room I had the pleasure of ventilating. It was rendered extremely unpleasant by the smoke and misty vapors and odors from the kitchen, the atmosphere being so clouded at times that one could scarcely discern the face of a friend a short distance off. To remedy this difficulty, ventilation was established, which proved, according to the certificate of the proprietor—which may be found in another place—"a complete success." The atmosphere, at all events, is free from smoke and kitchen odors.

PORK-HOUSE VENTILATION—MESSRS. SILVERHORN, MILLEMAN, AND
LOCKETT—PORK CURED AT FIFTY DEGREES OF TEMPERATURE.

A large proportion of the people of the United States, having no special regard for the old Mosaic law, are great lovers of pork, and consequently the pork business is a thriving and profitable branch of trade. This presupposes the necessity of pork-houses for curing and preserving the meat, and as the dealers frequently have from twenty to one hundred thousand dollars of their stock on hand at a time, the question of perfect ventilation is an important one, especially as thousands of dollars worth of the meat is liable to spoil in a very short time.

Among my earliest experiments in ventilation was one for Mr. Silverhorn, in New-York City, in 1862, who conducted a large pork establishment. By reference to his card at the end of this pamphlet, it will be seen that the experiment was successful. The foul and damp atmosphere of his cooling-rooms was replaced by

one perfectly dry and pure; his men ceased to complain of sickness; and he found his pork curing as well in summer, with the aid of my ventilating process, as it had done in winter at a temperature of thirty-eight or thirty-nine degrees. I may add that there has been no instance of pork going into one of my ventilated houses in a sound and sweet condition that was not found equally sound and sweet when taken out.

In 1863, I ventilated the pork-house of Mr. Millemann, who had been in the business forty years, and who had had ample experience with regard to the various methods of cooling and ventilating pork-houses. Observing the thermometer as high as fifty degrees under my direction, he became very much alarmed, as he had \$40,000 worth of pork on hand, and he had been accustomed to as low a temperature as thirty-eight or forty degrees. He found, however, that his pork cured better at fifty degrees than it had ever done with lower temperatures by the old methods. [See his card in another place.]

It will be seen therefore, that I use much less ice than is necessary in the old method. The most experienced dealers in pork deemed it requisite to have a temperature in their pork-houses of about thirty-six or thirty-eight degrees, but certainly never exceeding forty degrees; and when I proposed to employ a temperature of only fifty degrees, every one of them seemed to regard it with extreme skepticism. Hence it will be seen that it is the lack of ventilation in the old method which hastens the destruction of the meat, and that by ventilating efficiently, so as to carry off the foul air rapidly, the pork may be cured and preserved at a much higher temperature.

Joseph Lockett, one of the largest and most experienced English pork-packers in the country, deserves to be mentioned in this connection. He availed himself of my apparatus in one of his cooling-rooms as an experiment, and finding that it afforded a perfect ventilation, as will be seen by reference to his card in another place, he had it applied consecutively to all of his rooms. There can be no better authority upon the subject of pork-house ventilation, than that of Mr. Lockett.

VENTILATION OF STABLES — HORSES SICKEN AND DIE FROM BAD AIR
 — ZOÖLOGICAL GARDENS — VARNISH OF CARRIAGES DESTROYED —
 COW STABLES — POISONOUS MILK — STATEMENT BY PROFESSOR
 DOREMUS.

The ventilation of stables intended for the accommodation of our domestic animals, and especially the horse, is a matter of very great importance. It is claimed by those who have had ample experience, that there are more horses dying annually from imperfect ventilation than all other causes combined. Bad air is known to produce blindness in horses, which is becoming very prevalent, especially in New-York City, where horses are often crowded together in very small stables. A horse is frequently valued at five or ten thousand dollars, and sometimes more, and it is surprising that the owner of so valuable and noble an animal should ever endanger its health or life for the want of proper ventilation, which would cost but a trifling comparative sum. A horse, with its large, vigorous lungs, requires a large amount of fresh air, which it is impossible for it to obtain in a close or illy ventilated stable, especially when several animals are crowded together in a small space. The horse then begins to droop and show signs of disease; his ears grow cold; his eyes lose their brilliancy, and finally his sight becomes impaired; his step becomes less firm and elastic; and when he is taken from the stable, it is not until he has had time to take in copious draughts of pure, fresh air, that he begins to brighten up or manifest his usual vigor and animation. A horse is almost as susceptible to the influence of fresh air as a human being is to that of laughing gas, and in proportion as he is deprived of it, in that proportion will his health and usefulness be impaired, even though his life may not be destroyed.

A brother of mine in Boston, some years ago, had a valuable horse, which became sick in consequence, as it was believed, of a poorly ventilated stable. Its life being despaired of, it was arranged to send him to a veterinary surgeon in Cambridge, just across the river from Boston, for treatment. Three men were employed to conduct the animal to his new quarters, one to lead him, and the other two to support him on either side, as he was liable, from his great exhaustion, to stagger and fall to the ground. The bridge by which the river is crossed was finally gained, and here the horse appeared to be reviving under the influence of the pure air sweeping across the bridge. His step was gradually becoming more firm and elastic, but all at once he came to a sudden pause,

and threw up his head as if some new element of life had been infused into his veins. He stood quietly in this position for several minutes, with an appearance of delight and pleasure, and seemed to be instinctively taking into his lungs full draughts of the fresh air which he had so much needed, and which so revived him that in a short time he proceeded over the bridge with a vigorous step, without any support from the men in attendance. Let it not be forgotten, then, that fresh air is just as important to a horse as his food or drink.

"The effects of air vitiated by animal effluvia," says Mr. Tomlinson, in his "Rudimentary Treatise on Warming and Ventilation," "are evident in the diseases of the lower animals when crowded together in confined places. The glanders of horses, the pip of fowls, and a peculiar disease in sheep, all arise from this cause; and it is stated that, for some years past, the English nation has been saved £10,000 a year in consequence of the army veterinary surgeons adopting a plan for the ventilation of the cavalry stables."

The same writer quotes the well-known Dr. Arnott, who alludes to the want of knowledge among all classes on the subject of ventilation, and states that he had heard at the Zoölogical Gardens of a class of animals where fifty out of sixty were killed in a month from putting them into a house which had no opening in it but a few inches in the floor. It is pointedly added that this was like putting the animals under an extinguisher.

A noted lawyer of New-York, whose name I do not feel at liberty to give in these pages, applied to me to ventilate his stables, saying that he had just sold, or more properly given away, a pair of horses for which he had recently paid \$6000, in consequence of their sight becoming so much impaired as to render them nearly useless. He attributed the disaster to imperfect ventilation, but did not know how to remedy the difficulty. He had employed a leading architect to ventilate his art gallery, library, kitchen, etc., but his efforts were fruitless, and he was very zealous in the hope that I might produce better results by my improved system of ventilation.

I have ventilated a great many stables belonging to the wealthy citizens of New-York, and always with entire success. The atmosphere of these stables is generally stifling and offensive in a marked degree, and that horses confined within them should become blind, or sicken and die, need not excite our wonder. When those stables are properly ventilated, the air within them is always

sweet and wholesome, and the horses are in no danger of losing their health or their lives.

There is another reason why horse stables should be ventilated. The air within them is charged with ammoniacal vapor, which is not only injurious to horses, but tends to destroy the paint and varnish on carriages in a very short time. I have ventilated stables from this consideration alone, having no reference to the health of the horses.

Cow Stables.—These, as well as horse stables, should be well ventilated, for milk is an indispensable article of food, and no cow can furnish wholesome milk if she is forced to breathe a foul or contaminated air. We need not expect to find pure milk where we have not pure air. The poison of contaminated air finds its way through the lungs into the blood of the animal, and the milk inevitably partakes of the poison. Much of the milk sold in New-York is of this poisonous character. For illustration, I would refer to “an inspector’s report of the cow stable nuisance,” as given to the public through the daily papers by our new Health Board. The stables referred to were devoid of light, ventilation, and sewerage, being overcrowded and overheated, with filthy, disgusting stalls, and a filthy condition of the animals themselves. The yard, says the report, was filthy and wet, made so by the manure, urine, and water, which emitted a vile odor. These offensive matters flowed through a ditch into a “a good-sized stagnant pond,” which occupied the ground, constituting a “decided nuisance, pernicious to health and comfort.” So says the report. The owner of the cows, whose name is to be seen upon his milk wagons, is A. Dettinger, Fiftieth street, between Ninth and Tenth Avenues. If this Mr. Dettinger should be punished, we think it would be sufficient to force him to drink the milk from his own cows.

Professor Doremus, in a lecture lately delivered before the Free Academy, in this city, on electricity as a motive power, suggested that a new electric engine, invented by Mr. L. C. Stewart, to which he called special attention, might be found useful in propelling the street cars, instead of using so many horses, and remarked incidentally that the presence in our city of one hundred thousand horses, or more, with their accumulated fecal and renal secretions, constantly exhaling a foul odor into the atmosphere, must have more or less of a pernicious influence upon the health; and he thought it would be well, in a sanitary point of

view, if we could dispense with some of our horses, and use a motor such as the above in their place.

PALACES AND STABLES IN NEW-YORK CITY—A WORD ABOUT “FRESH MILK”—PEEVISH MOTHERS.

We copy the following article, under the above title, from Dr. Morris Mattson's “Facts for the People,” etc., from which we have previously quoted upon the subject of foul or noxious air :

“New-York City being the great commercial emporium of the United States,” says Dr. Mattson, “we have a great deal of wealth, with all of the refinement and luxury which usually accompanies it, and particularly very splendid up-town residences, which are sometimes designated *palaces*. This is all very well, but when it is found that these palaces are frequently in close connection with *horse and cow stables*, one begins to lose his relish for what may be considered the fascinations and charms of fashionable life. If, indeed, one is a lover of pure, sweet air, one would be more likely to sigh for a cottage upon the hillside than a palace in the city.

“But our chief business, in this article, is to speak of a certain up-town palace, owned by a certain wealthy gentleman, who was the owner also of four or five splendid horses, costing him five or six thousand dollars apiece, and an equally splendid cow, which he had selected from the finest breeds, and for which he paid an exorbitant price. The horses were to gratify his own taste, the cow to gratify the taste of his wife, who had frequently told him that there was nothing so desirable as ‘*fresh milk*’ for the coffee, and fresh milk also for the children. She had heard about sloped cows, and had no notion of using milk which came from such questionable sources ; she wanted pure, fresh milk from a cow of her own.

“This all looked very reasonable in theory, and the indulgent husband, having purchased the animals in question, was obliged to have a stable for their accommodation. But where to locate it was a difficult question to answer. He knew it was fashionable for New-York millionaires to have stables adjacent to their houses, and he had no objection to being in the fashion in this particular, but, unfortunately, he had no spare ground upon which to erect a stable. After due consideration, there seemed to be but one alternative, which was that of placing the stable *under ground* ; and one of his poetical neighbors assured him that this was a

'brilliant conception,' inasmuch as the stable would be *out of sight and out of the way*. The thought was not entertained for a moment that cows and horses need an abundance of fresh air; that this fresh air, with its vitalizing oxygen, is quite as important to them as their daily food and drink.

"The stable was finally completed, under the superintendence of a noted architect, who had it furnished with a number of 'ventilating flues,' which, however, in accordance with one of Dr. Franklin's notions, seemed more inclined to '*draw downward*' than *upward*. In due time the cow and the horses were installed in their new quarters; but scarcely a week had elapsed when it was discovered that the stable was emitting a most disagreeable odor. The 'ventilating flues' did not seem to be rendering much service. It happened about this time that the gentleman of the palace was taking a walk before sunrise, scenting the keen, pure air of the morning; and upon his return, he very naturally opened the stable door to look in upon his splendid cow and favorite horses; but, alas! his unwilling nostrils were saluted by such a perfume from the inclosure as to render him quite uncertain as to whether he would require any breakfast, and he was not at all sure that the '*fresh milk*' from the cow, of which his wife had said so much, would be particularly agreeable in his coffee.

"Time passed on, and the cow began to droop and sicken; the horses also looked dull, weary, and jaded, with all of the signs of disease, and it was deemed expedient to consult a veterinary surgeon in regard to their health. All this time the poor animals were sickening because they had not enough of pure air to breathe, and the atmosphere which was generated in this close and confined stable was too horrible for description. Escaping from the inclosure, it permeated the house, and was enough to sicken the whole family. Meanwhile, the milk of the cow was still used for family purposes, was given to the children, was put into the tea and coffee, and all without a suspicion that the milk was literally a poison. A cow can not yield pure milk unless she has pure air to breathe; shut her up in a close stable, so that the air about her will soon become contaminated by the poisonous carbonic acid gas from her lungs, and the foul emanations from her body, and she will soon show unmistakable signs of disease. Her milk, in the mean time, will partake of the disease of her body; indeed, it would seem as though the udder of the poor sick cow was a sort of *drainage* whereby nature sought to relieve her general system of some of its impurities. These impurities become incorpo-

rated with the milk, which is unfit to be taken into the human stomach. Every intelligent mother knows that her milk is influenced by the condition of her system. If she is peevish and fretful, (from well-assigned causes, perhaps,) her nursing child will be peevish and fretful; if she partakes of food which deranges her digestive organs, her child will be sure, almost, to suffer similar derangements; if she swallows a cathartic, the cathartic effect of the drug will be manifest in the child through the influence of her milk. The cow is no exception to the rule, and her milk should never be given to tender infants and young children without feeling assured that the animal is perfectly healthy.

"Stables, such as we have described, have frequently been ventilated by Mr. Gouge, rendering the air pure and sweet, which is a great boon to the poor animals inclosed within them, and an equally great boon to the families to whom they belong, for, living in palaces, they should enjoy the comfort, and pleasure, and delight which properly belong to palatial residences, of which pure air is the first and most important item.

"Houses and stables should not be adjacent to each other; or the latter, to say the least, should be ventilated in accordance with the plan which has been proposed and successfully executed by Mr. Gouge."

WATER-CLOSET VENTILATION.

Many of our finest houses are rendered almost intolerable by the water-closets, the foul odors of which may be detected from the basement to the attic, and yet the remedy is perfectly simple and easily applied. The unwholesome odors and gases may be readily exchanged for the sweet, pure air. In my mode of ventilating water-closets, the foul air *beneath* the seat is made to ascend through a flue, by means of a rarified atmosphere, carrying with it cigar smoke or other disagreeable odors *above* the seat, or within the inclosure or apartment in which the closet is located; and thus the mingled impurities of the atmosphere, so offensive to the sense of smell, and so injurious to the health, are scattered upon the wings of the wind. I have ventilated numerous closets for our wealthy families, and always to their great delight and satisfaction.

SMOKING-ROOMS—REGARD FOR THE HEALTH OF YOUR WIFE AND
FAMILY.

These should always be ventilated, whether they exist in public places or private houses. Even the accustomed smoker would be better not to inhale over and over again the smoke emitted from his cigar or pipe. Nor is the idea a very pleasant one of taking into one's lungs the tobacco smoke which proceeds from the mouth of another, mingled usually with an offensive breath and not unfrequently the noxious effluvia from ulcerated gums and decaying teeth. No true gentleman, who seeks the indulgence of his cigar, will allow himself to inflict the smoke upon others who may regard it as a nuisance. Hence, ventilation is necessary; and in that case you may smoke your cigar in the presence of your wife or daughter, or some anti-tobacco friend, without creating a feeling of unpleasantness or disgust. Where smoking-rooms are not ventilated, the paper upon the walls, the furniture, and every thing within the room, become saturated with the smoke, and are rendered very disagreeable. Many fine houses have been ruined by excessive cigar smoking, as the walls and wood-work retain the tobacco odor for a long period. Besides, your dresses become so tainted by the smoke as to render you disagreeable, in many instances, to ladies and gentlemen seated near you in cars, omnibuses, and public places. Every consideration then of refinement and delicacy, with a due regard for the comfort, well-being, and health of those about you, should either prompt you to give up the habit of smoking or to have your apartments ventilated so as to conduct the smoke quickly away. Even the health of your wife may suffer from the poisonous effects of your cigar; and yet she may not complain, as she does not wish to deprive you of any of your enjoyments. Rooms ventilated by my process are at once freed from the smoke, as well as any other impurity in the atmosphere, so that there is no taint nor disagreeable odor left behind.

SUB-CELLARS, BASEMENTS, ETC.—GOODS SAVED FROM RUSTING.

Cellars, basements, etc., may be supplied with a pure and dry air by my process of ventilation, so as to be fit places of abode, or suitable for the storage of goods which otherwise might be injured by the dampness. Attention to this matter would be the means, oftentimes, of saving thousands of dollars to the merchant, by the preservation of his goods, to say nothing of the preservation of the health and lives of the occupants of those places.

choicest goods which a store can produce are generally placed in the show-windows ; and it is desirable that they should be preserved from change or injury. This may be accomplished by my system of ventilation, which has been successfully adopted.

REFRIGERATORS.

Refrigerators of the smaller sizes abound in the market, and are purchased largely by families on account of their cheapness. Some of them claim to be ventilated, but it is in a very limited degree, and consequently articles of food can not be preserved in them for a long period. Every refrigerator, whether large or small, should be *perfectly ventilated*, whereby all the noxious or unwholesome gases which are constantly forming are carried off, and pure, dry, cold air furnished in their place. It is only under these conditions that food is wholesome or fit to be eaten ; for if foul air is allowed to accumulate in the refrigerator, it will be absorbed by the food, and its healthful qualities more or less impaired. It is the presence of this foul air which causes food to undergo decomposition, rendering it thereby unfit for use.

Refrigerators of a small size may be ventilated by my method, but I do not pretend to furnish them to the public. Refrigerators on a large scale, however, together with fruit and provision-closets and meat-houses, I am always ready to construct to order, and I have no evidence that they can be thoroughly and efficiently ventilated excepting by the plan which I have secured by my letters patent.

The air is always pure, sweet, and dry in my ventilated refrigerators ; and I have stated elsewhere that fresh meat will keep within them, during the hot weather of summer, for three weeks, and retain in the mean time its red color ; strawberries will keep ten days ; ripe peaches and delicate pears will keep three weeks, or longer, and so on to the end of a long chapter. The odor of one kind of food, however strong, will not be imparted to any other, because the odors and gases, as already explained, are not retained sufficiently long to undergo absorption by the provisions present.

The reader is referred to my certificates, in another part of this pamphlet, in proof of my assertions, and I only ask of the public to judge me by my works.

FACTS CONCERNING THE PRESERVATION OF MEAT, BUTTER, AND MILK
 — VENTILATED MILK AND BUTTER HOUSES — TESTIMONY OF MRS.
 G. S. ROBBINS.

It is a curious fact that fresh meat, suddenly frozen, will undergo a destructive change in its central or interior parts, so as to be unfit for use. Dr. Kane mentions a similar fact as taking place in the Arctic regions, with the thermometer fifty or sixty degrees below zero. The walrus and other meats, which he was enabled to obtain in those high latitudes, freezing suddenly, underwent decomposition in the interior, greatly to his surprise, and could not be used as food. The pork-packers acknowledge the loss of pork, now and then, from a similar cause. I know of but one explanation of the phenomenon. The frozen crust of the meat is probably impervious to the gases of the interior, so that they can not escape, and decomposition ensues precisely in the same way that fresh meat decomposes or putrefies in a close, unventilated refrigerator, notwithstanding the presence of ice. One thing at least is very apparent, namely, that in preserving fresh meat we need something more than a cold atmosphere; and I have elsewhere stated that in my ventilated refrigerators a temperature of only fifty degrees is all that is required for the preservation of fresh meat.

In contrast with the facts above stated, it is equally curious that in some sections of our country, and also in some parts of Mexico, fresh meat hung up in the open air, without any salt, even in the hot weather of summer, will not undergo any unfavorable change, but gradually dry up and remain fit for food. One explanation is, that certain prevailing winds sweep away all of the gases exhaled by the meat as fast as they appear, so that there are no noxious agencies remaining by which the meat can be decomposed.

There is a curious fact, also, in relation to milk, the interior portion of which frequently becomes sour, while the exterior portions continue sweet. This change takes place, notwithstanding the milk may be placed in a cold refrigerator, and the change occurs more speedily when the vessel containing the milk is closely covered. This difficulty in relation to milk has induced many of our citizens to apply to me for ventilated milk-houses, which they have used with much satisfaction, and which should have a place in every hotel, restaurant, and private family.

Butter, as well as milk, is extremely sensitive to the influence

of a pent-up and foul atmosphere, such as we usually find in refrigerators. A foul or strong odor will taint the very best butter in a very short time. Those who are using my *ventilated butter-houses* and *refrigerators* have no trouble in keeping their butter sweet and good for a long period of time.

With regard to the preservation of milk, I might quote several authorities, but will content myself with that of the well-known Mrs. G. S. Robbins, who deserves so well of her country for the noble services which she has rendered to our suffering soldiers at the McDougall Hospital at Fort Schuyler. One of my large refrigerators was placed in the hospital through her influence, and after the use of it for six months in connection with the "Ladies' Kitchen" she says: "It is certainly a most admirable invention, enabling us to keep, in the most perfect preservation, during the unusual heat of the past summer, *milk*, poultry, meats, fruits, vegetables, etc., with, as I have frequently heard the steward remark, a very economical consumption of ice."

BANKING-HOUSES—JUDGE HILTON AND HIS STABLE—VENTILATION OF THE NEW-YORK BANK—PURE AIR A VALUABLE PANACEA.

Banking-houses are usually much in need of ventilation, because the directors, cashier, clerks, and others employed, undergoing much severe labor, need a full and constant supply of fresh air; it is equally important that the poisonous carbonic acid gas which is given off at every breath from their lungs, and the poisonous effluvia also which are exhaled from their bodies, should be carried speedily away from the apartments; for if breathed over and over again, as is always the case where ventilation is deficient, the blood, according to the testimony of physicians, undergoes deterioration, and disease is often an inevitable consequence.

The well-known *New-York Bank* may be mentioned as an instance of this imperfect ventilation, which came to my knowledge through the instrumentality of Judge Henry Hilton, of New-York City, whose stable I had ventilated very much to his satisfaction. Owing to this circumstance he was kind enough to give me a letter of introduction to the cashier of the above bank, the well-known Mr. Meeker, suggesting that it would be well to employ me to ventilate the place. I found that the frequent complaints of its imperfect ventilation were well founded. The atmosphere was extremely close and vitiated. Much had been done to ventilate the place, but all efforts had proved unsuccessful. A num-

ber of flues had been constructed so as to open into the cashier's room, with the hope of obtaining adequate ventilation, but it answered no good purpose. I proceeded at once to put my system of ventilation into operation, and it was no sooner accomplished than every person employed in the cashier's room perceived an immediate and almost magical change in the atmosphere. Compared with the depressing influence of the foul air which they had been so long accustomed to breathe, it was like some delicious and renovating ether; and it had the effect, as I am informed, of restoring one of the clerks, who had been for a long time an invalid, to very good health. I have not thought of availing myself of my patent as a means of curing disease, but I get such marked and brilliant results, now and then, in that direction, that I feel constrained to speak of *pure air* as one of the very best remedies or panaceas which we possess.

WASHINGTON CITY POST-OFFICE—A FACT FOR THE SKEPTICAL—ORDERS FROM JAY COOKE AND GEO. W. RIGGS, THE NOTED BANKERS.

Post-offices, like banking-houses, need ventilation now and then. The mail-bags and leather pouches, when exposed to a damp atmosphere, are liable to become mouldy, and the atmosphere itself is very objectionable to those who have any regard for their health. All that is here said will apply to the post-office in Washington City, which I had the pleasure of ventilating, and I can not well refrain from appending the following letter by the Hon. S. J. Bowen, the postmaster. The letter was written to a gentleman in New-York City, without a suspicion, so far as I know, that it would come under my observation:

WASHINGTON, December 20, 1865.

MR. GAY: There has been in operation in the post-office in this city one of Gouge's Ventilators for the past two months. It was put in for the purpose of ventilating the basement, in which are stored the mail-bags and pouches from which a supply for other offices is drawn.

Before the Ventilator was put up, the air in the room was damp and impure, so much so as to be very disagreeable and unhealthy to persons remaining in it any length of time; and the leather pouches would be covered with mould and the sacks and bags with mildew. The Ventilator has removed both the bad air and the dampness, and a person can discover no difference in the air from that in the rooms above. The pouches and bags are now perfectly dry, and we think the Ventilator has already saved to the Department double its cost in preventing injury to them.

It was put up as an experiment, to be paid for if it succeeded. We would not have it removed for any consideration whatever. I think it will be very generally adopted in this city.

Truly yours, etc.,

S. J. BOWEN, *Postmaster.*

The experiment of ventilating the Washington post-office having been entirely successful, it attracted the attention of Jay Cooke and George W. Riggs, the noted bankers, who were so much pleased with what had been done that each one complimented me with an order to ventilate his banking-house in Washington City.

BANK-VAULTS.

These are not unfrequently pervaded by a damp atmosphere, which causes books, papers, and documents to become mouldy. Proper ventilation will render the air pure and dry, so that there will be no tendency of the books and papers to mould.

POWDER-MAGAZINES.

These magazines, I am informed, are very liable to become damp, which injures the powder, destroying its granular condition and causing it to form in concrete masses. An ordnance officer at the Brooklyn Navy-Yard, who had acquired some knowledge of my system of ventilation, suggested to me that it would be likely to prove valuable in connection with powder-magazines, and confirmed what is mentioned above in relation to the powder. He felt persuaded that my *Atmospheric Ventilator* would obviate every difficulty, and save much money to the Government and others who deal in the article. He spoke in commendation of another feature of the apparatus, which, no doubt, would be a desideratum, namely, the safe and efficient light which it would afford to the interior of the magazine. This light, it may be added, would be free from all danger of causing an explosion of the powder.

SAILING VESSELS, ETC.—COMMODORE FOOTE.

My method of ventilation can be applied to sailing vessels, steamboats, emigrant ships, etc., as easily and successfully as to school-rooms, churches, kitchens, sleeping-rooms, or parlors; and yet I have never had an opportunity of ventilating a sea-going vessel. I was applied to by Commodore Foote, just previous to his death, to examine the receiving-ship North-Carolina, lying at our navy-yard, which he was very anxious to have ventilated; but the matter was referred to the authorities at Washington, and before it was decided, the death of Commodore Foote took place at the Astor House. Since then there has been no action in the matter. I hope I may yet have an opportunity of rendering my services in this species of ventilation.

An old sea-captain tells me that the hold of a ship, in which the cargo is principally stored, is sure to become very damp if ventilation is not resorted to, and a copious condensation of moisture will take place on the under surface of the deck and the sides of the vessel. The water thus condensed will fall from the deck upon the cargo, and injure or destroy all perishable goods, as silks, cloths, sugars, teas, etc. As efficient ventilation would prevent the difficulties here spoken of, merchants and shippers might save themselves from heavy losses without much expenditure of money. Ventilation would also preserve the timbers of a ship, which are rotted by foul air. Ships, it would seem, are sometimes completely rotted by foul air within the short period of three years. It would certainly be economy for every ship-owner to incur a slight expense in ventilating his ship, rather than to take the chance of its total destruction.

CHURCHES—A NEW MODE OF VENTILATION TESTED—ANECDOTE OF
A DISTINGUISHED CLERGYMAN.

If it is not desirable for people to go to sleep during divine service, then it is important to ventilate your churches. It is not always dull sermons that make people drowsy; it is much more frequently the foul air of a church, which deadens all the faculties of the mind, and induces that drowsy condition so unpleasant to the individual, and yet so difficult to be overcome. Sleepiness in church and in other public places in which human beings are densely packed together is not dissimilar, in many instances, from the sleepiness and stupor induced by breathing the carbonic acid gas emitted from a charcoal furnace in a close room. The lungs of the auditors are indeed so many charcoal furnaces, throwing out every instant copious volumes of carbonic acid gas; and as churches are seldom or never ventilated, it is no wonder that people go to sleep. The only wonder is, that they do not frequently go to sleep never again to wake; and it will yet be found and acknowledged, by those who investigate hygienic and sanitary laws, that human life is frequently shortened by a slow and gradual process of poisoning, induced by the noxious air of churches and other public places.

It is my privilege, I trust, though I do not do it with any capitious spirit, to speak of a well-known church in which a new experiment in ventilation was tried. And, by the way, if ever a church needed ventilation, it was that one. It is densely crowded,

particularly in the evenings ; and if any one wishes to know how much *bad air* he can inhale in the course of two hours, without undergoing positive suffocation or asphyxia, he has only to make an evening visit to said church. The board of trustees finally concluded that a little less carbonic acid gas, and a little more pure, fresh air, would be a desideratum ; and, in accordance with that wise decision, they agreed to avail themselves of the services of an educated and distinguished gentleman who had introduced a new mode of ventilation, which was highly applauded by some of our popular journals. Explanations were made by him to those interested ; plans were drawn upon paper ; and every thing pertaining to the new method seemed to promise entire success. The experiment was duly undertaken ; a large number of men were employed ; the parties worked diligently for three months, and, as a matter of course, used up a large amount of money. Unfortunately, however, for some unexpected reason the experiment did not work well, and the enterprise was finally suspended, never again to be resumed.

Anxious to learn the particulars of the above experiment, and accidentally meeting the distinguished pastor of the church, with whom I had not the pleasure of an acquaintance, I nevertheless took the liberty of interrogating him upon the subject. Pausing for a moment, he made this sententious, emphatic, and characteristic reply, the words of which I can put on paper, but without giving any idea of the peculiar inflections of his voice, or the curious blending, as it seemed to me, of the humor and pathos which he infused into his answer. He said, " They have been at work *three months*, they have expended *three thousand dollars*, and they have not got fresh air enough into the church to feed *three flies*."

I have had an informal application to ventilate the above church, and if an arrangement should be made, I will agree—my motto being " No success, no pay"—to ventilate the church efficiently for much less than the above amount, or charge nothing for my services. I would so arrange the ventilation as to furnish an abundant supply of pure and warm air in the winter, while in the summer the heat radiated from the numerous gas-burners should not be felt. I would also relieve the congregation from the uncomfortable draughts of air proceeding from the windows in the galleries, which are thrown open during the services for the admission of fresh air in order that the people may not actually undergo suffocation.

Let this church be properly ventilated, and the noted pastor,

though he may not be more eloquent and impassioned, will be likely to add ten additional years to his pastoral life. Constant dropping, it is said, will wear out a stone; and so the breathing of foul air, at frequent intervals, along with great physical and mental effort, can not fail to make an ultimate impression even upon the healthful and vigorous system of the pastor in question. It was found that the soldiers in the English barracks, near London, in consequence of imperfect ventilation, did not live as long by ten years, upon an average, as the agricultural population, outside of the barracks, under similar conditions of life, excepting that they had a pure and wholesome air.

INSUFFICIENCY OF FLUES OR CHIMNEYS AS A MEANS OF VENTILATION—ORIGIN OF CHIMNEYS—DIVIDED FLUES.

Chimneys are an old institution—so old, indeed, that we are unable to determine who was the inventor, or in what country they were first employed. We are told of chimneys in Venice before the middle of the fourteenth century; in Padua, before 1368; and of a certain lord of Padua who came to Rome, and finding no chimneys in the inn where he lodged, because at that time fire was kindled in a hole in the middle of the floor, he caused two chimneys, like those that had long been used in Padua, to be constructed by the work-people he had brought with him. But the claim of the Italians to the invention of chimneys is questioned upon the supposition that they existed in England as early as the twelfth century. However this may be, chimneys began to multiply during the reign of the Tudors, and the subject becoming invested with a sort of artistic interest, it was said that “the chimney shaft became a prominent and beautiful feature in buildings.” A little later on, during the reign of Queen Elizabeth, chimneys were regarded as an indispensable “luxury”—that is the historic word—and apologies were made to visitors if they could not be accommodated with rooms provided with chimneys. Ladies, it is said, were frequently sent out to other houses in which they could enjoy, as already quoted, “the luxury of a chimney.” We have sadly deteriorated since the reign of “Queen Bess;” for, although three centuries have elapsed, our houses are so constructed that the existence of a room with a chimney is rather the exception than the rule. Hence, the question has been pertinently asked by a distinguished writer, “When will architects and builders be convinced of the fact that fire-places, as well as human beings re-

quire constant supplies of fresh air, and that it is their duty to provide every room with air-channels, placed so as to feed the fire without annoying the inmates?"

Although we have a better ventilation with a chimney than without it, yet it is incumbent upon me to point out the comparatively imperfect ventilation which a chimney usually affords. chimney or flue is described by Dr. Arnott as a pump—"a sucking or drawing air-pump," which is relied upon as a means of producing an *upward current* of air, and thereby procuring efficient ventilation. But that it notoriously fails is confirmed by our everyday experience. We find houses, stables, and public buildings supplied with chimneys, and yet we do not find good ventilation. I have spoken of the offensive condition of the atmosphere in the stable of Mr. Paran Stevens, and yet there was an ample flue at the head of each stall, with a large trap or ventilator in the skylight. If flues could have been of service, Mr. Stevens ought to have had a good atmosphere in his stable. I have spoken also of the *New-York Bank* as having a number of flues opening into the cashier's room, but without any good result in the way of ventilation. I have ventilated so many foul places in which there were flues or chimneys, that I need no other proof of the total inadequacy of this mode of ventilation.

I have spoken of the *upward currents* of air in chimneys, and if we could have those upward currents continually in motion, the problem of ventilation would be solved, and we should be troubled no more with a foul or vitiated atmosphere. But instead of these upward currents, it is a fact that we frequently have *downward currents*, and here is the real difficulty. Chimneys are not always then a luxury, as in the days of Queen Elizabeth. It has been conceded by many distinguished writers, including Dr. Franklin, that the currents in chimneys are irregular, passing *downward* frequently as well as *upward*. It has been stated that chimneys situated in the north wall of a house do not draw so well as those in a south wall, because when cooled by north winds they are apt to "*draw downwards*." Dr. Franklin has an elaborate explanation of what he terms the *ascending* and *descending* currents in chimneys, which vary according to the period of the day or particular seasons of the year. I have frequently satisfied myself of the existence of those downward currents in the flues of horse stables, which I have so frequently ventilated for our wealthy citizens, and in which the atmosphere is usually very offensive. A gentleman of distinction, connected with the New-

York Historical Society, applied to me to ventilate the rooms of the Society, and stated that, according to his experience and observations, currents of air *come down* flues or chimneys oftener than they *go up*.

A heated flue, it may be remarked, is of course more efficient than one not heated, but even this does not always furnish a good ventilation; and I desire, in this place, to invite attention to the important fact that heat communicated to a chimney from a stove, furnace, range, or other fire, is far less powerful or efficient for ventilating purposes than heat originating directly *within* the flue. This fact lies at the foundation of all my improvements in ventilation, as will be explained more fully hereafter.

Divided flues, or what perhaps may be termed *double flues*, have had some reputation in this country as a means of ventilation. This, we believe, is an English idea engrafted upon our stock of American notions and devices. It presupposes an out draught of heated air from the interior of a building through one tube or flue, with an insetting current of the colder external air through the other tube. In cold weather we have, without doubt, such a result as this; but when the external air is only a few degrees colder than that within the building, we believe it is not claimed that the action within the tubes is such as to produce any perceptible ventilation. During the greater portion of the summer, therefore, we should be without ventilation, while in winter we may have such a volume of cold air rushing into our apartments as to render the atmosphere chilly or uncomfortable. The Legislative Hall at Albany was ventilated upon this plan in 1862, but I never understood that the experiment was successful.

THE NEW METHOD OF VENTILATION EXPLAINED—THEORIES CONSIDERED—ADAPTATION OF THE VENTILATOR—PROFESSOR DRAPER'S MODE OF VENTILATION—ADVANTAGES OF THE VENTILATOR—QUESTION FOR PHYSICIANS—OUR PATENTS.

When we deal with a motive power, and wish to produce practical results, we know that the *cause* must be equal to the *effect*. All systems of ventilation, therefore, which do not recognize an adequate motive power, must be failures; and thus we have had repeated failures in this department of art and science, notwithstanding very plausible and apparently brilliant theories, which, in some instances, have seemed to captivate the judgment of able and distinguished men.

Theories should not be valued in reference to ventilation unless it is shown that they are in correspondence with practical results of an unquestionable and satisfactory character. If a church, kitchen, parlor, stable, banking-house or other place is to be ventilated, the first question should be, Can the foul air be got out, and pure air be made to take its place? If the answer is Yes, and the work is duly accomplished, it will be time enough to look after a theory, or to discuss problems in science and philosophy.

When air is made to ascend through a flue in virtue of a positive irresistible force, which has been created artificially, then, and not till then, shall we have a perfect ventilation; and this desideratum accomplished, we need not trouble nor vex ourselves about the upward and downward currents of air in chimneys, or other nice theoretical questions or problems.

The motive force to which reference is made above is the one through which our mode of ventilation is always accomplished. It consists of heated currents of air, which ascend through a flue, and by the strong ascensional power which is thus created every vestige of foul air—every unpleasant odor—every atom of the noxious gases—are carried irresistibly away and scattered to the four winds.

The air within the ventilator is heated and rarefied by a jet of burning gas, or other convenient flame, as already described, (see Description of Cut, opposite title-page,) and it is this device which we have secured by Letters Patent—which has enabled us to ventilate so many foul places to the entire satisfaction of our employers. We will assert again, that a jet of gas burning within a flue has a remarkable power in rarefying the air and producing powerful up-moving currents. Heat communicated to a flue or chimney by a stove, or furnace, external to it, as previously stated, is not to be compared with this in its power of producing ascensional currents, and withal can not be employed so continuously, nor with so little expense, as the jet of gas.

The apparatus, as a whole, with its lantern, flues, etc., constitutes what is termed "*Gouge's Atmospheric Ventilator*," and, when properly adjusted, will effectually ventilate the dampest cellar or basement, the deepest subterranean vault, or the foulest "black hole" that can be imagined, or brought within the range of its power.

* The *expense of the gas* used for ventilating purposes is trifling. Commencing with an ordinary burner, we soon establish a strong up-moving current within the ventilator, which, after a short

time, can be maintained by a feeble jet of gas, not amounting to more than one foot per hour. Thus we have an efficient motive power, operating constantly, day and night, without the necessity of any supervision or attendance, producing the most satisfactory ventilation, and furnishing a full supply of fresh air to one's kitchen, stable, sleeping-room, or other apartment.

ADAPTATION OF THE VENTILATOR, ETC.—Simple and obvious as is the principle of ventilation herein set forth, yet the proper adaptation of the apparatus to the various uses which the public require is often extremely difficult. Indeed, it is only by long experience, and a close application to the business in which I am engaged, that I have become successful; and I am free to confess that I have often made failures in my first attempts at ventilation; but in no instance have I ever abandoned a task which I had undertaken until I succeeded to the satisfaction of myself and the parties employing me. There are many important points which must not be overlooked in arranging plans for ventilation; for the adaptation of the means to the end varies with the place and locality—varies also with the character of the ventilation required. There are many details which need special attention, as, for example, the calibre of the ventilating pipes; the best position of the pipes in relation to the apartment to be ventilated; the proper adjustment of them in those cases in which from necessity they require to be partly horizontal; and the proper arrangement or adjustment also of their orifices, which is a matter of the very first importance.

It is not common for individuals engaged in a specialty to speak of failures in their business or profession, but I prefer to do so. Some years ago the well-known Mr. Ives, the proprietor of the Albemarle Hotel, in New York City, employed me to ventilate his larder or provision house for a stipulated sum. I made several failures in the attempt, known only to myself, and expended five times as much money as I was to receive for the work. Finally, however, I succeeded, to the entire satisfaction of Mr. Ives, and his card of commendation may be seen among my testimonials in another place. Since then he has employed me to ventilate other parts of his house. I make these statements for no other purpose than to show how much care and judgment are required to accomplish the work of ventilation successfully.

LEADING POINTS OF THE VENTILATOR.—1. It is simple in its construction, and never gets out of repair. 2. It requires no skill in its use, and no one to be in attendance, excepting to light the gas

in the lantern. 3. It costs but a trifle for the gas by which it is kept in operation, and is therefore extremely economical. 4. It can be readily introduced into any house, building, or inclosure which requires to be ventilated. 5. It will remove the foul air quickly, and as no other method of ventilation, ever yet discovered, is capable of doing. See address to "Architects and Builders," page 12.

PROFESSOR DRAPER'S MODE OF VENTILATION.—Professor Draper, who is highly distinguished as an author and man of science, recently published a Text Book on Physiology, Hygiene, etc., from which we have taken a motto for our title-page, and from which, also, we purpose to make brief extracts in relation to foul, damp air and ventilation. We do this chiefly to show that the mode of ventilation he has pointed out, as a sort of necessity, we presume, for family emergencies, is troublesome and incomplete compared with the plan to which we invite public attention.

"It is said," remarks Prof. Draper in his new book, "that in many of the houses in New-York the servants first light the fires and pump the water out of the cellars; though this may be an exaggeration, we all know that a damp cellar is the rule, and a dry one the exception. . . . It is, therefore, very important that the cellar of every house, whether private or tenement, should be properly cleansed, dried, and ventilated during the years when the epidemic diseases are raging, if at no other time. . . . In the winter season the furnace will generally produce a sufficient ventilation of the cellar, and prevent the foul air entering the house; but in the spring and summer, when cholera commences to rage with the greatest violence, the furnace is then extinguished, and there is no ventilation of the cellar. At this time the danger which impends may to a great extent be avoided by placing a small stove in it, in which a fire should be kept burning continually," etc.

Without assuming to discuss this matter, it must be obvious that a fire can not be kept *continually* burning in a stove without considerable expense, and a great deal of care and trouble in watching the fire. Besides, the fire is liable to go out from the negligence of the servant, and thus the absence of ventilation for a time, and more than likely for a whole night, may be the critical moment when the cholera, or some other disease, will number us among its unwilling victims. By the use of our Ventilator we have a perpetual motive power, which will cost but a trifle, and which will be a faithful guardian of our health, so far as ventila-

tion is concerned, whether the servants be asleep or awake. Moreover, the Ventilator will not only furnish an abundant supply of dry air, in place of the foul, damp, and noxious air so aptly described by Prof. Draper, but it will afford an agreeable light to one's cellar without any increase of the heat, which is not needed, to say the least, in summer.

ADVANTAGES OF THE VENTILATOR.—It removes foul air, unpleasant odors, and all noxious gases, as heretofore stated, and furnishes a constant supply of pure, sweet, dry air in their place, which should be a primary consideration with all who have a regard for their health, comfort, or lives.

It will furnish a bountiful supply of pure air to one's kitchen, so that one's food will be in a more wholesome condition for use, and if one's wife or daughter should go into the kitchen to superintend culinary or other duties, she can return to the parlor without having the disgusting kitchen odor upon her dress or person. Bishop Hughes has said that every young woman, however wealthy or accomplished, should graduate in the kitchen; and there is no doubt that young ladies, anxious, as they should be, to become accomplished housewives, would be much more inclined to oversee the affairs of the kitchen if, while there, they could have a sweet and wholesome atmosphere to breathe.

The Ventilator will remove the foul air from every part of your domicile, so that the odors and noxious gases from drains, water-closets, kitchens, damp or wet cellars or basements, and other foul places, will be effectually carried away, along with the unwholesome effluvia from your bodies, and the carbonic acid gas thrown out from your lungs and generated by your gas-burners or petroleum lamps. Thus, you may sleep sweetly all night in a pure, healthful air, which will greatly promote the health of your family, and especially that of your children, who are extremely sensitive to the influences of foul air. Rich furniture, gilded picture-frames, and fresco paintings upon walls and ceilings are frequently injured by foul, damp air, but may be effectually preserved by our mode of ventilation. This alone would more than pay for the cost of ventilation. It may be remembered that in 1863 we were visited by a peculiar atmosphere, which, through its dampness, or otherwise, had the effect to mould the paper upon the walls of our houses, and cause it to peel off; to mar the varnish of the furniture, to mould the carpets, and cause them to rot speedily; to mould even the pictures; and in some instances the canvas of the pictures was completely rotted, causing the entire loss of a large

number of invaluable pictures. Many houses in New-York City and Brooklyn had to be completely refitted in consequence of the injury sustained through the destructive influence of the atmosphere in question; and all of this loss and evil might have been counteracted by efficient ventilation, which would have prevented the stagnation of the damp or unwholesome air within the apartments.

The Ventilator removes impure air from *horse stables*, the ammoniacal vapors of which tarnish or destroy the varnish upon carriages, and cause horses to sicken and die. In this respect, therefore, ventilation would be a wise economy.

The Ventilator will prevent the rusting of goods made of steel or iron, stored in basements or other damp places. Thousands of dollars might be saved annually to the merchant dealing in goods of this description by efficient ventilation.

The Ventilator will furnish to your refrigerators and provision closets a pure, sweet, dry air, so that your food will not be tainted by the noxious gases which would otherwise be constantly accumulating, and you will be enabled to keep fresh meat, perishable fruits, and other articles of food for several weeks during the hot weather of summer.

The *excessive heat* which is frequently present in churches, legislative halls, and other public places is often quite as annoying as the foul air, and may be completely removed by my Ventilator. We have this excess of heat in churches in summer, when they are lighted with gas. Indeed, it would seem to be less difficult to heat a large hall than it is to get rid of the excess of heat after it is generated. A committee was appointed during 1865, by the two houses of Congress, in reference to the ventilation of the House of Representatives and the Senate Chamber; and Mr. Meigs, who was called before the committee, said that there was no difficulty in warming those two chambers; but when the heat was found to be in excess, it was not easy to get rid of it and at the same time maintain a pleasant and agreeable temperature.

QUESTION FOR PHYSICIANS.—Within the flue of the Ventilator, two feet or more above the lantern in which the jet of gas is undergoing combustion, we have a temperature varying from 212 to 300 degrees, according to the amount of gas consumed. With one foot of gas per hour we have a temperature of 212 degrees, and with three feet of gas the temperature will be about 300 degrees. The noxious gases of an apartment undergoing ventilation, including the *malarious poisons*, if they should be present, all pass

up this flue, and are exposed to the heat within the flue ; and the question arises whether any advantage of a sanitary character could be gained by the decomposition of these poisons through the agency of the heat. There would seem to be not merely *one* but a *number* of the malarious poisons, and, if I am not misinformed, they are decomposed and destroyed at a temperature varying from 190 to 210 degrees. If this be true, it would be easy to effect their decomposition within the Ventilator. When the foul air, whatever may be its composition, passes upward from the Ventilator into the atmosphere, it may be entirely incapable of doing further injury ; but still, this is a question which physicians can decide more easily than myself, and it would afford me great pleasure to hear any suggestions from them upon this subject, especially in reference to the epidemic influences which have been threatening our country. If the cholera, as some physicians have represented, is capable of being propagated through fecal discharges, and those discharges contain some specific malarious poison, it will be found of course in water-closets, and in the ventilation of these closets this terrible choleraic poison may be destroyed by the heat of the Ventilator and rendered forever harmless. The only question to be determined, therefore, is, whether the noxious gases and malarious poisons, after they have passed from the Ventilator into the air, are likely to return and give us any further trouble. If Yes, then the decomposition of the malarious poisons by the heat of the Ventilator would be a desideratum.

APPENDIX TO SECOND EDITION.

VENTILATION OF SCHOOL-ROOMS—A STARTLING FACT.

THE impure air in the school-rooms in New-York City and Brooklyn have long been proverbial ; but it has not been generally known, so far as I know, that it has tended to shorten the lives of the teachers. A startling fact in relation to this matter has been communicated to me by John Hayes, Esq., a well-known legal gentleman, who is a member of the Board of Education in New-York City, and, of course, well posted in every thing pertaining to our schools. He tells me that the teachers, particularly the women, usually die of consumption in six or seven years. This mortality Mr. Hayes attributes to the impure air of the school-rooms. This is a frightful mortality, and if teachers suffer in this way, the children under their tuition must also suffer. Are we justifiable in permitting such a sacrifice of human life, when we could so easily prevent it by proper ventilation, which would cost but a trifling comparative sum ? That impure air is a prolific source of consumption is no longer to be doubted, for able books have been written by the medical faculty, proving that it is a contagious disease. This being true, it will be apparent to every one how dangerous it is to breathe over and over again the confined air of a school-room, in which there are always a certain number of individuals suffering with disease of the lungs. It will be seen, by reference to our testimonials, that school-rooms may be perfectly ventilated, so that pupils and teachers may have an abundance of fresh air, without being obliged to take air into the lungs a second time which has been contaminated by the breathing process. See the impressive letters of Nathan Bishop, Elie Charlier, S. A. Farrand, and John Dunham, Esqs., under the head of "School Ventilation," among our testimonials at the end of this book.

DRIFTINGS OF THE PUBLIC MIND IN REFERENCE TO VENTILATION—THE
AIR WE BREATHE—TRIBUNE—JUDGE DIKEMAN—UNVENTILATED
COW-STABLES—PROTEST TO MR. BEECHER—BEECHER AND THE
MEDICAL PROFESSION—HARRIET BEECHER STOWE.

Since the publication of the first edition of our pamphlet on ventilation, in 1866, the subject seems to have excited unusual attention. We find articles upon it in the newspaper press and

in our monthly magazines. Editors, judges, clergymen, and literary celebrities have written upon it with an unction which shows how deeply they are impressed with its importance. A few samples of these "*driftings*" are here presented under appropriate heads:

THE AIR WE BREATHE—HORRIBLE FACTS.—We clip the following from a newspaper whose title we are unable to give, but we have noticed similar articles in the scientific and medical journals, and have no doubt of the truth and accuracy of the facts presented:

"A scientific Parisian has had the curiosity to make an analysis of the air that is breathed in a theatre, or any close audience-room that contains a great number of persons, with the following horrible results: He carried into a theatre at ten o'clock at night a bottle of ice placed on a plate, and then collected the vapor which rapidly condensed on the outside of the bottle and flowed down on to the plate. At first the vapor thus collected had the smell, the taste, and, so far as could be determined, every chemical quality belonging to the waters of the most deadly fever marshes. Under the microscope, this water was at first clear, but soon, that is to say in a week, it was found to be full of fine animalculæ. A little later on, these animalculæ had grown, and the big ones were seen pursuing and devouring the little ones. Still later on, at the end of two months, the water was thick with animalculæ, various forms were seen, and still the work of destruction was going on. At last but three hideous monsters were seen—microscopic monsters, of course, since they were contained in a drop of water—and these were still fighting to see which could devour the other. At the end of three months the water became clear and miasmatic again."

A FATAL WARNING.—The subjoined is from the New-York *Tribune* of May 11th, 1867. The article should be carefully read and deeply pondered:

"The Moravian Seminary at Bethlehem, Pa., has long been widely popular as a high school for young ladies. Its trustees and principal are probably as competent and faithful as those of almost any similar academy. Yet it seems that they have but one bedroom, twenty-five by twelve feet, for their *eight* servant-girls, and that this room, on the basement floor adjoining the kitchen, had but a single window and a door; and that, these being closed, (as of course they usually were while the girls slept,) there was absolutely *no* ventilation and no admission of fresh air! True, there was a single flue, which led from this room up into the pupils' dining-room overhead; but this flue was generally shut up, or only opened through a stove-pipe which led into the chimney. The stove being taken down on the return of spring, the pipe was allowed to remain, and down this pipe the gas from the stove above was regularly driven, filling the girls' bedroom with its poisonous fumes, until, on Sunday night last, it killed two of them outright and probably will kill one more. Of the remainder, two were badly and two more but slightly injured. The eighth did not retire till toward morning, when she discovered the mischief, though she did not comprehend it till daylight.

"Of course, this is not murder, but ignorance—gross, shameful, guilty ignorance. No person has any right to undertake the most responsible charge of a

seminary who does not know that a close bedroom is perilous to the health and life of even *one* human being, and more than eight times as perilous when its inmates are increased to eight. Had the managers of the Moravian Seminary known what it was their duty to know, and had they nevertheless packed these eight girls into one unventilated room, they *would* have been murderers of the darkest dye. Their ignorance palliates, but does not excuse, their wrong-doing. What will palliate the crime of the next set of wholesale homicides by means of unventilated bedrooms, or class-rooms, or halls for public meetings?"

VOICE FROM JUDGE DIKEMAN.—The following letter from Judge Dikeman, in reference to the non-ventilation of his court-room, will explain itself, and has, we may add, a wide range of application :

"BROOKLYN, April 24, 1867.

"*To the Honorable Board of Supervisors of Kings County :*

"The undersigned beg leave to say that, deeply impressed with the duty of affording persons charged with crime in said county a speedy trial, and of lessening as much as possible the expense of the county in jurors' fees, the Court of Sessions has from time to time for some years, and continuously since October last until about three weeks since, been usually held for five days in the week and for five to seven hours each day.

"This service has been performed under the most unfavorable circumstances, and is extremely injurious to our health and the health of the jurors and others, arising from the want of suitable heat in cold weather and imperfect ventilation at all times.

"That our experience has demonstrated to our entire satisfaction that without better ventilation we can not, with due regard to our health and the health of others, hold the Court of Sessions in the room now used for the purpose more than two hours each day—one hour in the morning and one hour in the afternoon—giving time for ventilation by opening the doors and windows between these times.

"We have therefore, after mature deliberation, determined that we will not hold said Court in the room more than two hours in any one day. We regret the necessity of this determination, especially in view of the increased expenses which must result to the county for jurors' fees and the support of prisoners detained in jail awaiting trial.

"But there is one relieving consideration—that it will afford time to the presiding judge to give proper attention to the civil business of the County Court, which he can not do while the Court of Sessions is held five days in a week, and six hours in a day.

Yours respectfully,

"JOHN DIKEMAN,

"County Judge.

"W. H. HOYT,

"STEPHEN J. VOORHEES,

"Associate Justices."

THE EFFECT OF BADLY VENTILATED STABLES ON COWS.—Morris Phelan was charged with cruelty to animals in keeping his cows confined in a stable, in Skillman street near Flushing avenue, *without light or ventilation*, and had a hearing before Justice

Cornwell. During the trial the following testimony was given by Dr. Samuel R. Percy, Professor of Materia Medica, residing in West Thirty-eighth street, New-York City. We copy from the New-York *Times*:

"Q. What would be the effect upon cows confined in a dark, badly ventilated stable, in narrow stalls, chained so that their heads could only move about six inches, kept in that position for many months and fed upon soft food? A. The first effect on the animals would be to produce an uneasy, feverish state, with a loathing and rejection of food. This feverish state would last more or less during the confinement of the animal. At length a toleration of its circumstances would be acquired, so that the animal might live and yet not be healthy. Within a week or so after its confinement, another symptom, soreness of the feet, would occur—the feet would become tender, and he had seen hundreds of cases where the poor animal kept constantly changing its position on account of the tenderness and soreness of its feet. If the animal is long confined in such stables, the hoofs become elongated and the animal is thrown back upon the heel; that has been noticed in a number of cases. He had seen animals of this description unfastened and let out. The effect is the same for a time after they get out on the ground—a constant lifting of the feet and a constant change of position. The animals also became sore by lying down. He had seen many sores left by sloughs, in the same way as bed-sores, by the animals lying down for ease. The effect of the air in these cases would be very deleterious, leading to impurity of the blood. So injurious had he seen this effect of bad air, that he had seen rows of cattle breathing over one hundred times a minute, while naturally they should breathe about twenty. The effect of the rapid breathing is to increase the frequency of the heart-beats till they become so rapid that it is impossible to count them. This must produce a general fever. Another disease produced by herding cows together in confined places is to give them what is called the 'Distemper,' which all cows take in these stables, unless vaccinated to prevent it. This vaccination is a cruel practice, causing the tail of the poor animal to swell, to become extremely sore, and frequently to compel the amputation of the tail to save the cow from death. It is this practice which has given the characteristic name of 'stump-tails.' (The witness here spoke about the cow-stables in Holland, where diseases were engendered by the close confinement of cattle, and thence spread, not only throughout Europe, but in this country, and he contended that thousands have died from diseases of the nature thus described.)"

A PROTEST TO MR. BEECHER.—A writer, with a somewhat caustic pen, addresses the following letter to the Rev. Mr. Beecher, (Henry Ward, we presume,) through one of the public journals, and signs himself, "Your loving but greatly distressed HEARER."

"MY DEAR BROTHER BEECHER: I take great pleasure in saying that I attended your lecture delivered last evening before the Christian Medical Association, and was charmed and delighted with its freshness and pointed practicalness. The home thrusts at the politico-sanitary management of these two great cities, the medico-politico metaphors, such as the great systems of veins and arteries (sewers) reeking with poison which they distributed to the destruction of the lives of our citizens, capital hits at our ignorance of the laws of dietetics and hygiene, and most

pungent admonitory thrusts at the profession because they did not undertake an active crusade against all these crying evils.

"All this was splendid and soul-satisfying, but, my dear and reverend brother, with your clairvoyant spirit, were you not conscious that all the while you were thus spending your electric power upon your vast audience, at least one half of it were suffering the torture of slow poison from one of the sources against which you were most loudly inveighing, to wit, bad ventilation? For one I was obliged to put forth my utmost power, although extremely interested in the discourse, to prevent somnolency. Others around me in the gallery complained in the same manner.

"The old adage, 'Charity begins at home,' it seems to me, should have its exemplification just here. And to this end I, with a thousand more miserable suffering sinners, beg that you will immediately stir up—with a very acutely acuminated stick—the pure minds of your Trustees, that they may at once set their house in order in this respect; for by doing so they will most assuredly save many bodies, if not souls, from death, and cover up a multitude of sins, or, at least, save a multitude from breaking the commandment against cursing."

BEECHER AND THE MEDICAL PROFESSION. — The "DISTRESSED HEARER," whom we have quoted above, had reference to a discourse delivered by Mr. Beecher before the New-York Medical Students' Christian Union, delivered February 3d, 1867, at Plymouth Church, Brooklyn. We find it reported in the *Herald of Health* for April, 1867. I make from it a few piquant extracts. Mr. Beecher remarks that "it is a part of the business of the medical profession to teach the great truths which stand connected with health in the matter of air and light;" and then proceeds as follows in relation to the foul air of houses, steamboats, churches, etc.:

"The principal use which men seem to put air to is to destroy it. They go into their houses and shut out the exterior air, and burn by stoves that which is inside, and poison it by breathing, and then, when it is thoroughly destructive, they go on breathing it, and sucking it in, as if it were a confection or a luxury! Is there any body that teaches men what air means when applied to travel in steamboats? It is enough to set one to retching just to remember the cabin! Is there any body to teach the community the benefit of air in railway cars, in churches, in lecture-halls, in places of crowded assembly? We should scorn with ineffable scorn to sit down at a plate where a man had just eaten his meal, and take the knife that had been in his mouth and put it in ours; but we will sit down and breathe the air that he has breathed, and that his wife has breathed, and that his children have breathed, and that the servants have breathed, and that forty others have breathed, and will think it just as good for our breathing, and will breathe it over, and over, and over again, as if it was a precious morsel! There seems to be no power to impress men that God made pure air for promoting health, and that impure air produces the crime of sickness—for I think that sickness is a sin."

BODILY RELIGION. — A VOICE FROM HARRIET BEECHER STOWE.—*The Atlantic Monthly*, for July, 1866, has an article entitled "*Bodily Religion*," which is understood to be from the pen

of Mrs. Stowe. It contains some home thrusts in relation to foul air, etc., which can not fail to interest the intelligent and utilitarian reader.

"Take our pretty boy," she says, "with cheeks like apples, who started in life with a hop, skip, and dance; to whom laughter was like breathing, and who was enraptured with plain bread and milk; how did he grow into the man who wakes so languid and dull, who wants strong coffee and Worcestershire sauce to make his breakfast go down? . . . What is the boy's history? . . . He is made to sit six hours a day in a close, hot room, *breathing impure air*, putting the brain and the nervous system upon a constant strain, while the muscular system is repressed to an unnatural quiet."

WANT OF VENTILATION IN SCHOOL-ROOMS, ETC.—The writer continues her article as follows:

"The want of suitable ventilation in school-rooms, recitation-rooms, lecture-rooms, offices, court-rooms, conference rooms, and vestries, where young students of law, medicine, and theology acquire their earlier practice, is something simply appalling. Of itself it would answer for men the question, why so many thousand glad, active children come to a middle life without joy—a life whose best estate is a sort of slow, plodding endurance. The despite and hatred which most men seem to feel for God's gift of fresh air, and their resolution to breathe as little of it as possible, could only come from a long course of education, in which they have been accustomed to live without it. Let any one notice the conduct of our American people traveling in railroad cars. We will suppose that about half of them are what might be called well-educated people, who have learned in books, or otherwise, that the air breathed from the lungs is laden with impurities, that it is noxious and poisonous; and yet, travel with these people half a day, and you would suppose from their actions that they considered the external air as a poison created expressly to injure them, and that the only course of safety lay in keeping the cars hermetically sealed, and breathing over and over the vapor from each others' lungs. If a person in despair at the intolerable foulness raises a window, what frowns from all the neighboring seats, especially from great rough-coated men, who always seem the first to be apprehensive! The request to 'put down that window' is almost sure to follow a moment or two of fresh air."

FOUL AIR OF COURT-ROOMS.—The writer dwells upon this subject in a most impressive manner, and it would be well for the legal profession if they would take a hint from what she has written. She says:

"We have spoken of the foul air of court-rooms. What better illustration could be given of the utter contempt with which the laws of bodily health are treated than the condition of these places? Our lawyers are our highly educated men. They have been through high-school and college training, they have learned the properties of oxygen, nitrogen, and carbonic-acid gas, and have seen a mouse die under an exhausted receiver, and of course they know that foul, unventilated rooms are bad for the health; and yet generation after generation of men so taught and trained will spend the greater part of their lives in rooms notorious for their close and impure air, without so much as an attempt to remedy the evil. A well-ventilated court-room is a four-leaved clover among court-rooms. Young men are constantly losing their health at the bar: lung diseases, dyspepsia, follow

them up, gradually sapping their vitality. Some of the brightest ornaments of the profession have actually fallen dead as they stood pleading—victims of the fearful pressure of poisonous and heated air upon the excited brain. The deaths of Salmon P. Chase, of Portland, uncle of our present Chief-Justice, and of Ezekiel Webster, the brother of our great statesman, are memorable examples of the calamitous effects of the errors dwelt upon; and yet, strange to say, nothing efficient is done to mend these errors, and give the body an equal chance with the mind in the pressure of the world's affairs."

FOOD AND FRESH AIR CONTRASTED.—Mrs. Stowe proceeds very ingenuously and pungently as follows:

"People would never think of bringing a thousand persons into a desert place, and keeping them there, without making preparations to feed them. Bread and butter, potatoes and meat, must plainly be found for them; but a thousand human beings are put into a building to remain a given number of hours, and no one asks the question whether means exist for giving each one the quantum of fresh air needed for his circulation; and these thousand victims will consent to be slowly poisoned, gasping, sweating, getting red in the face, with confused and sleepy brains, while a minister with a yet redder face and a more oppressed brain struggles and wrestles, through the hot, seething vapors, to make clear to them the mysteries of faith. How many churches are there that, for six or eight months in the year, are never ventilated at all, except by the accidental opening of doors? The foul air generated by one congregation is locked up by the sexton for the use of the next assembly; and so gathers and gathers from week to week, and month to month, while devout persons upbraid themselves, and are ready to tear their hair, because they always feel stupid and sleepy in church. The proper ventilation of their churches and vestries would remove that spiritual deadness of which their hymns and prayers complain. A man hoeing his corn out on a breezy hillside is bright and alert, his mind works clearly, and he feels interested in religion, and thinks of many a thing that might be said at the prayer-meeting at night. But at night, when he sits down in a little room where the air reeks with the vapor of his neighbor's breath and the smoke of kerosene lamps, he finds himself suddenly dull and drowsy—without emotion, without thought, without feeling—and he rises and reproaches himself for this state of things."

ARSENIC AND PRAYER-MEETING.—"Suppose that a revival of religion required, as a formula, that all the members of a given congregation should daily take a minute dose of arsenic in concert, we should not be surprised after a while to hear of various ill effects therefrom; and, as vestries and lecture-rooms are now arranged, a daily prayer-meeting is often nothing more nor less than a number of persons spending half an hour a day breathing poison from each other's lungs. There is not only no need of this, but, on the contrary, a good supply of pure air would make the daily-prayer-meeting far more enjoyable. The body, if allowed the slightest degree of fair play, so far from being a contumacious infidel or opposer, becomes a very fair Christian helper, and, instead of throttling the soul, gives it wings to rise to celestial regions."

TAVERN LIFE IN CONNECTICUT.—"Let a person travel in private conveyance up through the valley of the Connecticut, and stop for a night at the taverns which he will usually find at the end of each day's stage. The bed-chamber into which he will be ushered will be the concentration of all forms of bad air. The house is redolent of the vegetables in the cellar—cabbages, turnips, and potatoes—

and this fragrance is confined and retained by the custom of closing the window-blinds and dropping the inside curtains, so that neither air nor sunshine enters in to purify. Add to this the strong odor of a new feather-bed and pillows, and you have a combination of perfumes most appalling to a delicate sense. Yet travelers take possession of these rooms, sleep in them all night without raising the window or opening the blinds, and leave them to be shut up for other travelers."

EXPERIMENT IN CHURCH VENTILATION.—"An energetic sister in the church suggested the inquiry, whether it was ever ventilated, and discovered that it was regularly locked up at the close of service, and remained so till opened for the next week. She suggested the inquiry, whether giving the church a thorough airing on Saturday would not improve the Sunday services; but nobody acted on her suggestion. Finally, she borrowed the sexton's key one Saturday night, and went into the church and opened all the windows herself, and let them remain so for the night. The next day every body remarked the improved comfort of the church, and wondered what had produced the change. Nevertheless, when it was discovered, it was not deemed a matter of enough importance to call for an order on the sexton to perpetuate the improvement."

RECEIPT FOR CONSUMPTION, DYSPEPSIA, ETC.—"The spare chamber of many dwellings seems to be an hermetically closed box, opened only twice a year, for spring and fall cleaning; but for the rest of the time closed to the sun and the air of heaven. Thrifty country housekeepers often adopt the custom of making their beds on the instant after they are left, without airing the sheets and mattresses; and a bed so made gradually becomes permeated with the insensible emanations of the human body, so as to be a steady corrupter of the atmosphere.

"In the winter, the windows are caulked and listed, the throat of the chimney built up with a tight brick wall, and a close stove is introduced to help burn out the vitality of the air. In a sitting-room like this, from five to ten persons will spend about eight months of the year, with no other ventilation than that gained by the casual opening and shutting of doors. Is it any wonder that consumption every year sweeps away its thousands? that people are suffering constant chronic ailments, neuralgia, nervous dyspepsia, and all the host of indefinite bad feelings that rob life of sweetness, and flower, and bloom?"

TESTIMONIALS.

HOTELS.

ALBEMARLE HOTEL, Cor. of Fifth Ave. and Twenty-fourth Street, New-York.

You ask me to say what I think about the Atmospheric Refrigerator. I have used both the Meat House and Chest for the last ten months. It works beautifully, and to my entire satisfaction. In fact, it comes fully up to your recommendation. I believe it is the only right principle for a Refrigerator.

GEORGE D. IVES, *Proprietor*.

BREVOORT HOUSE, NEW-YORK, Jan. 19, 1864.

Dear Sir: I have had in use your system of ventilating Meat Chests and Ice Houses for eight or ten months, and am so much pleased with its operation that I take every opportunity to show and recommend it to my friends, as being the best thing I know of to preserve meats, with the least quantity of ice.

ALBERT CLARK, *Proprietor*.

ST. NICHOLAS HOTEL, N. Y., Jan. 21, 1864.

Dear Sir: We are well satisfied with our experience that your mode of ventilating Meat Houses is a decided improvement, and will commend itself for its good preserving qualities and saving of ice, to all who test it properly.

Yours truly,

SPOTTS & HAWK.

FIFTH AVE. HOTEL, New-York, Feb. 2, 1865.

Mr. H. A. GOUGE: Dear Sir—We take pleasure in assuring you that after a long and thorough trial of your Ventilating Apparatus, we are convinced that it is the very best of the kind extant. Very truly yours, HITCHCOCK, DARLING & CO.

ST. JAMES HOTEL, New-York, Jan. 19, 1864.

Dear Sir: Having thoroughly tested your patent Ice House, constructed for this hotel, we cheerfully add our testimony to the many testimonials in its praise, as being, in our opinion, the most perfect and economical of those now in use. It not only preserves the meats, etc., for an indefinite time, but it consumes very little ice. Wishing you every success, we remain,

Very respectfully yours,

T. F. WELLS & CO., *Proprietors*.

Dear Sir: We take great pleasure in certifying that we have had in use for nearly a year one of your Ice Houses, erected by you, and which has given us entire satisfaction. We find it to keep Meats, Fish, etc., with the use of a small quantity of ice; and think it the most economical thing of the kind that can be used in a hotel.

Yours very truly,

J. CURTIS & CO.

BRANDETH HOUSE, NEW-YORK, Jan. 20, 1864.

MERCHANTS' HOTEL, 41 Cortlandt Street, N. Y., May 8, 1865.

Dear Sir: We have had in use the large Meat House you constructed for this Hotel now about one year; it has given us entire satisfaction. The ventilation seems to be perfect. Yours, etc., CLARKE & SCHENCK, Merchants' Hotel.

WESTERN HOTEL, 9 Cortlandt Street, N. Y., May 6, 1865.

Dear Sir: The Atmospheric Meat House which you constructed for this hotel has now been in use for about one year, and has given entire satisfaction. I know of no other system of Ventilating which is effectual; your plan appears as perfect as it is simple.

D. D. WINCHESTER.

BELMONT HOTEL, 133 to 137 Fulton St., N. Y., May 9, 1865.

Mr. H. A. GOUGE: Dear Sir—The Ventilating Apparatus put up by you in my dining-room about four months ago is a complete success. I am very much pleased with its operation. The room has been greatly improved by it. The principle is undoubtedly correct. Yours respectfully,

J. P. RICHARDS.

PRIVATE FAMILIES.

This certifies that I have used your Atmospheric Refrigerator during the last nine months, and I can truly say that it surpasses all methods that have been in use for preserving in an edible condition whatever may be placed within it. In fact, I believe it comes fully up to the claims of the inventor.

SAM'L S. GUY, M.D., 181 Fort Greene Place, Brooklyn, N. Y.

The Refrigerator you sent me last season has proved to be all you claim for it. I think it surpasses your modest recommendations as the correct method for preserving Meats and Fish, (raw and cooked,) Fruit and Vegetables; and I have no doubt but you will find that this will soon supersede all other Refrigerators in use.

WILLIAM H. SMITH, 42 West-Jersey Street, Elizabeth, N. J.

I take pleasure in recommending your improved principle for Refrigerators, as the most scientific and perfect yet offered to the public. The one which you introduced into my house about a year ago has never failed to accomplish all that you promised for it. Yours,

JOHN D. ASCOUGH, 171 West 11th Street, New-York.

We have used the Atmospheric Refrigerator in our family for the last year. I believe it to be the best Refrigerator in the world, and I can't conceive how it can be more perfect. We place all articles of food in it with Sweet Butter, etc., and we have none of the experience that I have had with other Refrigerators. You have conceived a plan that will surpass all others, without doubt.

Yours,

JOSEPH SCOTT, *Silver Plater,*

No. 70 John St., New-York, and 24 Butler St., Brooklyn.

PROVISION HOUSES.

Mr. H. A. GOUGE: The Ventilating Apparatus you put up for me works to my entire satisfaction. I think I have given it as severe a test as it can possibly be put to. My cooling rooms (25 x 50) which were in my cellar and sub-cellar, were in a very bad condition—foul and damp—so much so it was very unhealthy for men, water constantly dropping from the ceiling. Since I have had your Apparatus there are no signs of dampness; the atmosphere is perfectly dry and pure; have not had a man complain of sickness. My pork cures as well in summer as in a winter atmosphere of 38 or 39 degrees. Your invention has been very valuable to me, and I cheerfully recommend it to Pork Packers, Butchers, etc., as the best thing I am acquainted with for the purpose.

HENRY SILVERHORN, *Pork Packer,* 92 Christie St., N. Y.

NEW-YORK, 152 West Street, Jan. 31, 1864.

MR. H. A. GOUGE: Dear Sir—Some few months ago we were at a loss to know what kind of an Ice House to put in our Packing House, which we were then fitting up, when you came to us and proposed to put up your Ventilating Chill Rooms, and not charge us a cent if they did not work well. We are happy to say that they did all you claimed for them, to our perfect satisfaction. A cold, dry, pure air, such as can not be got in any other ice house. Yours truly,

D. & W. H. MILLEMAN, 152 West Street.

BROOKLYN, NEW-YORK, Jan. 29, 1864.

Dear Sir: About one year ago, as an experiment, we had your Ventilating Apparatus applied to one of our Cooling Rooms, at our Packing House in Raymond Street. We are now satisfied with its utility enough to have it applied to all of our rooms. We believe it makes a perfect ventilation.

Very respectfully,

JOSEPH LOCKITT & CO.

BUTCHERS' MEAT HOUSES.

NEW-YORK, Jan. 27, 1864.

Dear Sir: I have had in use the Atmospheric Meat House you built for me, now about one year, through an unusually hot summer, and ice of the poorest quality. I can say that it has given me entire satisfaction, and, as I tell my friends, I never paid for any thing that gave me so much real pleasure. I cheerfully recommend it to butchers and families as the best Refrigerator that I am acquainted with.

Yours, etc.,

DAN'L F. FERNALD,

Union Market, Tillary cor. Fulton St., Brooklyn, New-York.

The Meat House you built for me last June suits me in every particular. The ventilation is so perfect, the air within is always perfectly pure and dry, free from sweat or moisture of any kind. I can hang meat up in this house with the animal heat in it, and it will cure as perfectly as in a winter atmosphere of 38 to 40 degrees. With my experience, I conceive it to be the most useful invention of the age for the purpose. I cheerfully recommend it to the trade generally;

Wishing you every success, yours respectfully.

CHARLES W. CONWAY, *Butcher*, 275 3d Avenue, New-York.

This is to certify that I have used in my business the Atmospheric Meat House for the last nine months, and will say that it works to my entire satisfaction, both summer and winter. I have experimented with it, particularly as to its quality of preserving Fruit, and am satisfied for this purpose it can't be beat. I believe this Meat House is the best thing ever used for the purpose.

D. TILTON, *Dealer in Poultry and Game*,

No. 12 Franklin Market, & 74 & 76 Tompkins Market, New-York.

444 SIXTH AVENUE, New-York, Jan. 23, 1864.

Dear Sir: I have great pleasure in bearing testimony to the every superior system adopted by you of ventilating Meat Chests and Ice Houses. I have now tried your plan some time, and it gives me great satisfaction in saying that it is far superior to any others, and I shall consider it to be my duty to recommend its adoption to my friends.

I am, dear sir, yours respectfully,

JOSEPH COLWELL.

May 6, 1865.

MR. H. A. GOUGE: Dear Sir—The Ventilating Apparatus put up by you in my Shop about one year ago is a complete success; I have kept Meats in it during the summer months for four weeks without taint or change of color, and did not lose a pound of meat during the entire season. I would not do without it for ten times its cost.

B. JOACHIM, 48 Greenwich Street, New-York.

Nos. 29 and 30 FULTON MARKET, New-York, May 10, 1865.

MR. H. A. GOUGE: Dear Sir—Please make for me another of your Ventilating Meat Houses, 6 by 10, 8 ft. high, in sections, so that it can be shipped in the hold of a vessel. I want it as soon as possible. Those which you made for me last season, and which were shipped to the West-Indies, have given complete satisfaction.

CHARLES COOPER.

MISCELLANEOUS.

WASHINGTON, December 20, 1865.

MR. GAY: There has been in operation in the Post Office in this city one of Gouge's Ventilators for the past two months. It was put in for the purpose of ventilating the basement in which are stored the mail-bags and pouches, from which a supply for other offices is drawn.

Before the Ventilator was put up, the air in the room was damp and impure, so much so as to be very disagreeable and unhealthy to persons remaining in it any length of time; and the leather pouches would be covered with mould and the sacks and bags with mildew. The Ventilator has removed both the bad air and the dampness, and a person can discover no difference in the air from that in the rooms above. The pouches and bags are now perfectly dry, and we think the Ventilator has already saved to the Department double its cost in preventing injury to them.

It was put up as an experiment, to be paid for if it succeeded. We would not have it removed for any consideration whatever. I think it will be very generally adopted in this city.

Truly yours, etc.,

S. J. BOWEN, *Postmaster*.

POST-OFFICE, WASHINGTON, D. C., June 16, 1866.

HENRY A. GOUGE, Esq.: Dear Sir—We have had in operation, in this office, one of your Ventilators for eight months past. It was put in for the purpose of ventilating the basement of the office, in which are stored the mail-bags and pouches, from which a supply for other offices is drawn. The effect of the Ventilator has been to render the basement, which was extremely damp before, perfectly dry, and to change the air, which appears now to be as pure as in the rooms above. Many persons have visited the rooms to see the operation of the machine, and all have expressed themselves delighted with it, and it has saved to the department more than its original cost by preventing mildew and mould from collecting on the mail-bags. I can recommend its adoption by all wishing good ventilation by a cheap and simple apparatus—one that will not fail to effect the required object.

The statement made in my letter to Mr. Gay in December last, in reference to the operations of the Ventilator, have been more than confirmed by the further trial of eight months.

Truly yours, etc.,

S. J. BOWEN, *Postmaster*.

I visited the City Post-Office purposely to see and examine the Ventilator spoken of above, and observe its effects, and I have never seen more perfect ventilation than has been effected by its use.

B. B. FRENCH, *Commissioner of Public Board*.

OFFICE OF THE TRIBUNE, New-York, February 9, 1865.

MR. H. A. GOUGE: Dear Sir—I cheerfully testify to the efficiency of the Ventilators put up by you in our Editorial Rooms. The principle is unquestionably correct. In the disconnected outer room, where ventilation was most needed, the success is perfect.

Your ob't servant,

S. H. GAY.

NEW-YORK, February 9, 1865.

MR. H. A. GOUGE: Dear Sir—I have your Ventilating Apparatus in use at my house and stable. Its operation is perfectly satisfactory, and I am so much pleased with it that I cheerfully recommend it to the public.

Yours, etc.,

PARAN STEVENS, 238 Fifth Avenue.

MR. H. A. GOUGE: It gives me great pleasure to furnish you with my opinion as to the merits of your "Ice Closet," based upon six months' experience of the one

in use at the "Ladies' Kitchen," McDougall Hospital. It is certainly a most admirable invention, enabling us to keep in perfect preservation, during the unusual heat of the past summer, Milk, Poultry, Meats, Fruits, Vegetables, etc., with, as I have frequently heard the Steward remark, a very economical consumption of ice.

MRS. G. S. ROBBINS, 15 West-Seventeenth Street, New-York.

NEW-YORK, February 4, 1864.

Dear Sir: The large cooling room you built for this place about a year ago, I am glad to say gives me great satisfaction. I believe it does all you promised. Your mode of lighting and ventilating these rooms is perfect.

Yours, etc.,

J. H. CROOK, 39 and 40 Park Row.

CHAMBERLAIN'S OFFICE, BROADWAY BANK, New-York, March 23, 1866.

S. H. GAY, Esq.: Dear Sir—I have now had "Gouge's Ventilator," which you recommended to me, in use in my stables for several months, and it gives me great pleasure to state that, in my judgment, it is decidedly the most perfect ventilator yet invented.

Very resp'y yours,

DANL. DEVLIN.

OFFICE OF THE COMMISSIONERS OF EMIGRATION, }
Castle Garden, New-York, June 27, 1866. }

We have in use, in this office, two of Gouge's Ventilators. I have no hesitation in saying that they have proved effective, and that our office is relieved of the foul air, which was so unhealthy and disagreeable. The principle is undoubtedly correct, and his mode of adapting it to general use is simple and effective.

B. CANNERY, *General Agent Com. Sup. of Emigration,*

State of New-York.

OFFICE OF R. HOE & Co., Printing Press Machine and Saw Manufacturers, }
29 and 31 Gold Street, New-York, June 27, 1866. }

We have recently put in one of Mr. Gouge's Ventilators, and find its operation very satisfactory. The principle he adopts we believe to be very correct, and he applies it in a simple manner, producing the desired effect.

R. HOE & CO.

31 EAST TWENTY-THIRD STREET, June 28, 1866.

Mr. H. A. GOUGE: Dear Sir—The Ventilating apparatus, as well as the Refrigerator, which you placed in my house last fall, have proved so entirely satisfactory that I recommend all my friends, who are building or altering their houses, to introduce both, and it gives me much pleasure to hear that your orders are rapidly increasing.

Very truly yours,

J. AUGUSTUS HAMILTON.

OFFICE OF THE TRIBUNE, }
New York, June 30, 1866. }

We have, for several years, used Mr. Gouge's Ventilators, and have found them exceedingly beneficial in ventilating our vaults, press-room, and other rooms. They have worked to our entire satisfaction.

The Tribune Association,

SAMUEL SINCLAIR, *Publisher.*

I also introduced one into a milk-room in my farmhouse, where I could not keep milk last year, and it has enabled me to keep the milk, etc., entirely sweet.

S. S.

THE BROOKLYN DAILY UNION, }
No. 30 Front Street, Dec. 6, 1866. }

I know Mr. Gouge's system of ventilation to be capable of producing excellent results, and I am personally indebted to him for having rendered comfortable and

healthy, a close room, packed in summer with dense, noxious air, and in winter with dampness. I believe the system to comprise the practical application of the most advanced principles of ventilation; and is successful wherever I have seen it applied.

Mr. Gouge himself is a gentleman of integrity and high standing.

EDWARD CAREY, *Editor Union.*

VENTILATION OF LATIMER HALL, BROOKLYN, NEW-YORK.

I proposed to appropriate my hall for the general requirements of balls, religious, social, and political meetings. I have received more than an anticipated patronage, but continual complaints were made to me of the objectionable heat, etc., of the hall when only partially filled. It further occurred to me that, when the hall was packed to its fullest capacity, a serious interference with the comfort of the audience was visible, and the orchestra in particular (which is in an elevated gallery) was so insufferably hot and unpleasant that the musicians, much to the diminution of their usefulness, were obliged to be removed to the floor of the hall. After as many expedients as any reasonable man could be expected to make, and each in succession alike failing to render even a partial relief, I applied to Mr. Gouge. His apparatus was put up, since which my patrons have been more than satisfied, and the musicians agree that the orchestra gallery, heretofore unendurable, is now continually cool and relieved from offensive effluvia.

I am justified in recommending Gouge's apparatus for similar purposes.

BROOKLYN, Dec. 12, 1866.

J. G. LATIMER.

SCHOOL VENTILATION.

U. S. CHRISTIAN COMMISSION FOR THE ARMY AND NAVY, }
NEW-YORK COMMITTEE, No. 30 BIBLE HOUSE, }
NEW-YORK, Dec. 10, 1866. }

H. A. GOUGE, ESQ.: Dear Sir—During the eighteen years of my official connection with the largest Public Schools in New-England, it was one of my duties to give much attention to the ventilation of School Buildings, some of which contained between six and eight hundred pupils.

For years, I have carefully observed the practical working of the more popular systems of ventilating public buildings, and I am free to say, I consider your method of producing good ventilation the best now before the public. The *constant force* created in the ventilating flues by means of *artificial heat* at their base causes a *uniform current* of vitiated air to ascend in the flues, whether the atmosphere outside is hot or cold, in motion or at rest.

By varying the number and size of the flues, and the amount of combustion in them, your principle of ventilation is equally applicable to the *smallest rooms* and to the *largest halls*.

Your success in ventilating in a satisfactory manner cellars, basements, churches, and large halls where other plans have failed, is the best evidence of the value of your system of ventilation.

Very respectfully yours, etc.,

NATHAN BISHOP.

CHARLIER INSTITUTE, ENGLISH AND FRENCH SCHOOL FOR YOUNG GENTLEMEN, }
No. 48 East Twenty-fourth Street, New-York, Dec. 11, 1866. }

For many years I tried different means of ventilation. Having many school-rooms without chimneys in which common ventilators were insufficient, so that the atmosphere was oppressive when a large number of pupils were congregated, I finally concluded to incur the expense attending the introduction of Mr. Gouge's apparatus.

I have watched it closely. I believe its philosophical principle correct, and the results are certainly highly satisfactory, as much so probably as can be reached in a large school. I found it particularly useful in heavy, damp weather.

ELIE CHARLIER.

COLLEGIATE ACADEMY, 695 Sixth Ave., N. Y., Jan. 22, 1867.

HENRY A. GOUGE, Esq.: Dear Sir—For many years I tried in vain to secure thorough ventilation of my school-rooms. Last fall I met with one of your circulars, and was sufficiently convinced to try your patent. It has proved a perfect success. With nearly three times as many pupils in the room as before, the air is always fresh and pure. I am but doing my duty to the public in earnestly recommending your Ventilator. Yours truly, S. A. FARRAND.

BOARD OF EDUCATION, CORNER GRAND AND ELM STREETS, {
NEW-YORK, April, 1867. }

H. A. GOUGE, Esq.: Dear Sir—In the daily discharge of my duties as Engineer of the Board of Education of the city of New-York, I have heard frequent complaints of the bad ventilation of Public School-rooms. In order to remove the causes of these complaints, I have examined with care the more popular systems of ventilation in this country and in Europe, and am convinced yours is superior to any that I have seen. This opinion is founded on actual trial of your ventilating apparatus.

A few months ago, our Committee on Warming and Ventilating directed me to have it put into three of the worst-ventilated school-rooms under my supervision: and since the work was done, these rooms, though crowded with scholars, have been well ventilated, and the experiment is a complete success.

Very respectfully yours,
JOHN DUNHAM, *Engineer to the Board of Education of New-York.*

TESTIMONIAL OF GENERAL HOWARD.

BUREAU REFUGEES, FREEDMEN, AND ABANDONED LANDS, {
HEADQUARTERS ASS'T COM., D. C., WASHINGTON, April 10, 1867. }

H. A. GOUGE, Esq.: Dear Sir—Having had your Ventilating Apparatus introduced into the building for the Home for Colored Orphans in this District, I take pleasure in bearing testimony to its superior merits for the purposes for which it was designed. From the simplicity of the mechanism I judge that it will not easily get out of repair. The material of which it is made is durable. It occupies little space in the building. From these considerations, and especially from its adaptation to the end in view, namely, a perfect ventilation of the apartments, I regard it the best apparatus of the kind I have yet examined.

I am, sir, very respectfully, your obedient servant,

C. H. HOWARD, *Brev. Brig-Gen., Asst. Comr., D. C.*

TESTIMONIAL OF AN ARCHITECT.

153 BROADWAY, NEW-YORK, June 30, 1866.

Mr. H. A. GOUGE: Dear Sir—I have used your tubes supplied with artificial heat for the purpose of creating an upward current of air from a room insufficiently ventilated, and they answered the purpose.

Your adjustment is founded upon natural and practical principles, and I consider it economical. Yours respectfully, JOHN W. RITCH.

Business Notice.

H. A. GOUGE,

THE MANUFACTURER AND PATENTEE OF

"GOUGE'S ATMOSPHERIC VENTILATOR,"

Holds himself in readiness to make applications of the same for any of the purposes of Ventilation, whenever called upon by his patrons.

HIS APPARATUS IS ADAPTED TO

Parlors, Dining and Sleeping Rooms; Kitchens and Basements; Cellars, Vaults, and Water Closets; Tenement Houses; School, Lecture, and Court Rooms; Churches; Legislative Halls; Poor-Houses, Prisons, and Hospitals; Factories and Dye-Houses; Breweries and Distilleries; Powder Magazines; Stores and Show Windows; Banking Houses, Hotels, and Restaurants; Fruit and Provision Closets; Pork-Packing Houses; Meat Houses for Hotels, Butchers, etc.; Stables; Ships and Steamboats; Etc., Etc.

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